

EXHIBIT 27

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

In Re: Bair Hugger Forced Air)
Warming Products Liability)
Litigation)

This Document Relates To:)

All Actions.) MDL No.
15-2666 (JNE/FLN)

VIDEOTAPED DEPOSITION OF SAID ELGHOBASHI
Newport Beach, California
Thursday, June 15, 2017

Reported by:
ELIZABETH BORRELLI, CSR No. 7844, CCRR, CLR
JOB NO. 124785

Videotaped Deposition of SAID ELGHOBASHI,
Volume I, taken on behalf of the 3M, at 4675
MacArthur Court, Suite 1250, Newport Beach,
California, commencing at 11:32 a.m.,
Thursday, June 15, 2017, before Elizabeth
Borrelli, a Certified Shorthand Reporter in
the State of California, License No. 7844.

* * *

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Also Present:

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I N D E X

WITNESS	EXAMINATION
SAID ELGHOBASHI	
By MR. GORDON	39, 281
By MR. ASSAAD	205

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<p style="text-align: right;">Page 6</p> <p>1 Exhibit 18 Expert report by Dr. John 150 2 Abraham in re 3M Bair Hugger, 3 33 pages 4 INFORMATION REQUESTED 5 (None) 6 UNANSWERED QUESTIONS 7 (None) 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>	<p style="text-align: right;">Page 7</p> <p>1 LOS ANGELES, CALIFORNIA; THURSDAY, JUNE 15, 2017 2 11:32 A.M. 3 4 THE VIDEOGRAPHER: Good morning. We are 5 now on the video record. The following is the 6 videotaped deposition of Said Elghobashi in the 7 matter of Bair Hugger Forced Air Warming Products 8 Liability Litigation, which is filed in the United 9 States District Court for the District of Minnesota, 10 Case No. 15-2666. 11 This deposition is being held at Dentons 12 US, LLP, 4675 MacArthur Court, Suite 1250, in 13 Newport Beach, California. Today's date is 14 Thursday, June 15th, 2016 [sic]. The time now is 15 11:32 a.m. 16 My name is Michael Mullin from TSG 17 Reporting. The court reporter is Liz Borrelli. All 18 counsel will be noted on the stenographic record. 19 Will the court reporter please swear in 20 the witness. 21 SAID ELGHOBASHI, 22 having been duly administered 23 an oath in accordance with CCP 2094, 24 was examined and testified as follows: 25 THE REPORTER: I think counsel wanted to</p>
<p style="text-align: right;">Page 8</p> <p>1 state their appearances on the record. 2 MS. ANDREWS: Yes. So my name is Anne 3 Andrews, Andrews Thornton Higgins & Razmara. I'm a 4 member of the plaintiffs' executive committee in 5 this matter. To my right. 6 MR. THORNTON: John Thornton. 7 MR. ASSAAD: Gabriel Assaad from Kennedy 8 Hodges. 9 MS. ZIMMERMAN: And Genevieve Zimmerman 10 from Meshbescher & Spence. 11 MS. ANDREWS: Counsel? 12 MR. GORDON: Corey Gordon on behalf of 3M 13 and Arizent and -- 14 MS. ANDREWS: And, sir? 15 MR. GORDON: -- with me is Professor John 16 Abraham. 17 MS. ANDREWS: So Mr. Abraham -- Professor 18 Abraham, are you a -- a witness in this proceeding? 19 MR. ABRAHAM: I am one of the expert 20 witnesses on the defense. 21 MS. ANDREWS: So you're appearing here on 22 behalf of 3M; is that correct? 23 MR. ABRAHAM: Correct. 24 MS. ANDREWS: Are you going to be giving 25 any testimony or asking any que- -- questions here</p>	<p style="text-align: right;">Page 9</p> <p>1 today? 2 MR. GORDON: Cou- -- Counsel, this is -- 3 this is not Professor Abraham's deposition. He's 4 here to assist me. If you have any questions 5 about -- 6 MS. ANDREWS: Well -- 7 MR. GORDON: -- his -- his presence 8 here -- 9 MS. ANDREWS: -- I do. 10 MR. GORDON: -- you can ask me about it. 11 MS. ANDREWS: Fair enough. I do. So I 12 just want to be sure that everyone -- it's -- it's 13 unusual for other people to be present at such a 14 proceeding. This will be, from what I understand, a 15 confidential proceeding. You will ask for 16 confidential. The parties have agreed to 17 confidentiality at the end of the proceeding, so -- 18 MR. GORDON: Professor Abraham has signed 19 the confidentiality -- 20 MS. ANDREWS: So I'd like -- 21 MR. GORDON: -- order. 22 MS. ANDREWS: I'd like an assurance that 23 the professor has signed a confidentiality agreement 24 because there will be proprietary information. 25 MR. GORDON: You just got it.</p>

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1 MS. ANDREWS: Okay. I have a few more
2 things to remind Mr. -- counsel and -- and Professor
3 Abraham about that --

4 MR. GORDON: No, actually, Counsel, this
5 is my deposition. So if you want to -- you want to
6 take time --

7 MS. ANDREWS: These are really simple
8 admonitions, Counsel. Everybody knows what the
9 rules are. We have an -- we have someone here who
10 is not a member of our bar, who is not admitted in
11 this case.

12 MR. GORDON: And -- and -- and I'm
13 responsible for his presence here.

14 MS. ANDREWS: That's exactly --

15 MR. GORDON: I will -- and I will be
16 responsible for --

17 MS. ANDREWS: That's exactly what I wanted
18 --

19 MR. GORDON: -- what he does and doesn't
20 do at this deposition. He doesn't need --

21 MS. ANDREWS: That's exactly what I wanted
22 to remind you of.

23 MR. GORDON: -- to be lectured by you --

24 MS. ANDREWS: If he --

25 MR. GORDON: -- and I don't need to be

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1 lectured by you.

2 THE REPORTER: Counsel.

3 MS. ANDREWS: You are not being lectured
4 by me. You are being advised --

5 MR. GORDON: Okay.

6 MS. ANDREWS: -- that everyone in this --

7 MR. GORDON: I want to move on with this
8 deposition. If -- and you said you -- before, you
9 said would wait --

10 MS. ANDREWS: If you are responsible for
11 his -- for his being here today, you're also
12 responsible for his conduct, which means that he is
13 to conduct himself in the matter of these
14 proceedings --

15 MR. GORDON: Counsel --

16 MS. ANDREWS: -- as if we were in court.

17 MR. GORDON: I've been practicing law for
18 37 years.

19 MS. ANDREWS: So have I.

20 MR. GORDON: I kind of -- kind of
21 understand the rules.

22 MS. ANDREWS: I do too.

23 MR. GORDON: So let's go ahead. I don't
24 want to impose on Professor Elghobashi any more than
25 is necessary.

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1 MS. ANDREWS: That's very kind of you, but
2 I -- we're -- we are making a record for the Court
3 to be sure that no one acts in an improper fashion,
4 and that's -- that is highly important to us and to
5 you, and no one -- no one violates a protective
6 order entered by a federal judge in this matter.

7 So we're all on the same page; is that
8 correct, sir?

9 MR. GORDON: I'm prepared to go forward
10 with the deposition, and --

11 MS. ANDREWS: So I am too.

12 MR. GORDON: Okay.

13 MS. ANDREWS: So but the first order --

14 MR. GORDON: You -- you -- you've said --
15 you've -- you've had your time to make your record.
16 You've made your record.

17 MS. ANDREWS: Thank you, sir. So the
18 next --

19 MR. GORDON: Let's -- let's --

20 MS. ANDREWS: So the next item of business
21 is the response to your subpoena. I'm prepared to
22 produce the documents that you have served a formal
23 subpoena in this case. Would you like to proceed,
24 sir? We have the notice.

25 MR. GORDON: I -- I mean, yeah, I've been

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1 wanting to proceed for several minutes now.

2 MS. ANDREWS: We have the notice.

3 MR. GORDON: Great.

4 MS. ANDREWS: Would you like to attach a
5 copy of it to the record or shall I?

6 MR. GORDON: I'm -- I'm going to see how
7 I -- how -- how things go. I don't want to make a
8 decision until I've -- if you want to produce some
9 records that he --

10 MS. ANDREWS: Well, if you don't want the
11 documents I have --

12 MR. GORDON: No, give the -- give me the
13 documents.

14 [Reporter requests attorneys speak one
15 at a time.]

16 MS. ANDREWS: All right. So we received a
17 subpoena. Apparently, counsel will attach it if he
18 so chooses, a copy of the subpoena signed by Deborah
19 Lewis in the matter served on Dr. Elghobashi with a
20 attachment, items No. 1 through 20 as follows. So
21 we have a response to all the items for your
22 subpoena, and we'd like to give them to you and
23 attach them formally to the record at this time.

24 Item No. 1, Item No. 1 is the documents
25 meeting this request were previously produced on

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6/12 when we sent to defendants a Dropbox links -- a Dropbox link with the following documents: The CAD files, the papers or reports cited in the Rule 26 report and Dr. Elghobashi's custody simulated human skin scales from -- from the Lees and Brighton article entitled "Simulated Human Skin Scales," 1972, photographs of drapes of the operating room, and the errata sheet.

Did you receive those documents, sir?

MR. GORDON: You know what? Counsel, when you're done making your record, why don't you let me know and I'll come back in.

MS. ANDREWS: Did you receive the CAD files --

MR. GORDON: I'm not under a --

MS. ANDREWS: -- we sent to you?

MR. GORDON: I'm not here to be deposed by you. I'm not here to have this deposition taken over by you.

MS. ANDREWS: Fair enough. So when --

MR. GORDON: When you're done with --

MS. ANDREWS: You can --

MR. GORDON: -- making your record and you can pay the court reporter for the transcript of --

MS. ANDREWS: You can le- -- you can leave

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if you want --

MR. GORDON: -- whatever it is you do --

MS. ANDREWS: -- but it seems kind of silly since I'm going to hand you the documents that you requested.

MR. GORDON: No, what you're doing is silly.

[Reporter requests attorneys speak one at a time.]

MS. ANDREWS: All right. So Exhibit No. 1

--

MR. GORDON: Excuse me.

MS. ANDREWS: -- to the attachment is being produced. The -- the Humulate -- the "Simulated Human Skin Scales" is No. 1. It will be Exhibit No. 1 that we've produced pursuant to the subpoena, the formal subpoena in this case.

No. 1B --

MR. GORDON: Let me know when you're ready to con- -- begin your deposition.

(Whereupon Mr. Gordon left the deposition proceedings at this point in time.)

MS. ANDREWS: -- is the deposition request for four photographs. If you want to mark these.

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THE REPORTER: I'll wait.

MS. ANDREWS: You probably shouldn't because there are going to be a lot.

THE REPORTER: I don't have the exhibit stickers, ma'am. Can we go off the record?

MR. ASSAAD: Sure.

MS. ANDREWS: Do you need exhibit -- exhibit stickers?

THE REPORTER: I need to go off the record.

MS. ANDREWS: Why do you need to go off the record?

THE REPORTER: Can you go off the record or do I have to --

MS. ANDREWS: No, I get to say when you go off the record. Why do you need to go off the record?

THE REPORTER: Okay. I'm -- I'm going off the record. You can be on the video record. I'm going off the official record.

(Off the official record.)

(Whereupon the court reporter left the deposition proceedings at this point in time.)

(Whereupon the court reporter entered

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the deposition proceedings at this point in time and the official record was resumed.)

MS. ANDREWS: So make that 1.

(Whereupon Mr. Gordon entered the deposition proceedings at this point in time.)

(Discussion off the record.)

THE REPORTER: Counsel, I have given her the exhibit stickers --

MR. GORDON: No.

THE REPORTER: -- because she wanted to mark --

MS. ANDREWS: Thank you very much.

THE REPORTER: -- the exhibit.

MR. GORDON: I'm sorry. This is my deposition. You're not going to take -- be marking exhibits during my examination. When I'm finished, if you want to mark exhibits, if you want to conduct your own direct examination, that's what the rules permit. You're not taking over my deposition.

MS. ANDREWS: Counsel, you issued a subpoena in this case.

MR. GORDON: So fine. Give me the --

MS. ANDREWS: And I have giving you --

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1 MR. GORDON: Give me documents and let me
2 move on.
3 MS. ANDREWS: -- the documents. I am
4 giving them to you, is exactly what I'm doing.
5 MR. GORDON: But I'm --
6 MS. ANDREWS: You're --
7 MR. GORDON: -- you're not going to mark
8 them as --
9 MS. ANDREWS: -- somehow not happy.
10 MR. GORDON: -- exhibits during my
11 deposition. You can mark them during yours -- your
12 -- your portion. If I choose to mark them, I'll
13 mark them --
14 MS. ANDREWS: Fine.
15 MR. GORDON: -- in the order that I want
16 to mark them.
17 MS. ANDREWS: We won't give them to you
18 then. We will hou- -- we will attached them
19 exhibits at the end of the deposition, so...
20 MR. GORDON: No, we -- you --
21 MS. ANDREWS: I don't know how to make you
22 happy, sir.
23 MR. GORDON: Just give me the --
24 MS. ANDREWS: I've never done a deposition
25 with you.

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1 can --
2 MS. ANDREWS: So I'll sit back --
3 MR. GORDON: -- hand me the documents.
4 MS. ANDREWS: No, I'm not handing them to
5 you. I'm going to make a record that I did give
6 what I gave to you. This is a very complicated case
7 with a lot of files that I want -- I've asked you if
8 you received files that we sent you. You had no
9 response for me. It's a courtesy and a -- and a --
10 and customary that we be professional to each other
11 in giving each other subpoenaed documents and make a
12 record so that everyone knows we came here
13 prepared --
14 MR. GORDON: I -- I --
15 MS. ANDREWS: -- to give you.
16 MR. GORDON: I'm -- I'm prepared to accept
17 that your representation that the stack of documents
18 you have are responsive to the subpoena.
19 MS. ANDREWS: That's fine, but that's not
20 how I'm going to offer them. So you start the
21 deposition, sir, and then we'll come to these when
22 you feel --
23 MR. GORDON: No, the --
24 MS. ANDREWS: -- like you want them.
25 MR. GORDON: The subpoena calls for the

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1 MR. GORDON: Give me the documents.
2 MS. ANDREWS: I am entitled, sir, to make
3 a record of what I've produced here today. It's
4 very simple.
5 MR. GORDON: Yes, fine. You can make
6 the --
7 MS. ANDREWS: Your hostility is very out
8 of line.
9 MR. GORDON: You can make the record when
10 it's your -- when it's your turn.
11 MS. ANDREWS: It's just a record of giving
12 you the documents that you requested.
13 MR. GORDON: It --
14 MS. ANDREWS: This is done all the time.
15 MR. GORDON: I -- well, okay. I'm -- I --
16 I must have just missed it.
17 MS. ANDREWS: No.
18 MR. GORDON: I've never had --
19 MS. ANDREWS: Can you just be resp- -- be
20 reasonable that I'm trying to respond? I have a --
21 I have a half a foot of documents here to hand you,
22 and I'm trying to do it in a fashion that's
23 responsive to a federal subpoena, and you won't --
24 don't appear to be -- to want me to.
25 MR. GORDON: And -- and that's fine. You

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1 production of the documents before the deposition.
2 Before -- before my examination. I want the
3 documents. If you --
4 MS. ANDREWS: If you -- no, you do want
5 them now. You just don't want me to mark them.
6 MR. GORDON: I -- that's right. I don't
7 want you to choose how -- how and where to mark --
8 MS. ANDREWS: Okay.
9 MR. GORDON: -- exhibits in this portion
10 of the deposition.
11 MS. ANDREWS: Okay.
12 MR. GORDON: If you want to read into the
13 record what you're -- what you're producing to me,
14 I'll -- you know, that's fine. You're an officer --
15 MS. ANDREWS: Will you --
16 MR. GORDON: -- of the Court.
17 MS. ANDREWS: Will you stay here for that
18 part of the reading instead of walking out in the
19 middle of my trying to give you a record of what
20 I've given you? Will you -- will you remain in the
21 deposition, sir --
22 MR. GORDON: I --
23 MS. ANDREWS: -- while I comply with your
24 subpoena?
25 MR. GORDON: If you want to just go

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1 through and explain what -- what's in each folder
2 and how -- that's fine.

3 MS. ANDREWS: That's what I intended to
4 do.

5 MR. GORDON: Okay. Well, you were doing a
6 lot more than that.

7 MR. THORNTON: And we have the perfect
8 right to mark anything we give you --

9 MR. ASSAAD: Just -- just -- just mark it
10 as --

11 MR. THORNTON: -- for the record. I'm
12 going to -- there's no reason to quibble here.

13 MS. ANDREWS: It's a simple way to mark
14 them, unless you want me to hand them -- hold them
15 up to the video and so we have a video record of
16 everything I gave you. It's really not that
17 contentious. I'm sorry if you -- if you're offended
18 by it. So --

19 MR. GORDON: Well, if it's not that
20 contentious, why aren't you just giving me the
21 documents like --

22 MS. ANDREWS: I explained myself.

23 MR. GORDON: -- everybody else gives?

24 MS. ANDREWS: I explained -- I explained
25 myself to you. I'm not everybody else. I'm here

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1 today answering a federal subpoena and marking
2 documents at -- for the record to be sure that we
3 understand what we gave you. There were 20 requests
4 on an attachment to this federal subpoena. You
5 recall that, correct, sir?

6 MR. GORDON: Uh-huh.

7 MS. ANDREWS: So we're giving you the
8 attachments, the -- the response to the documents
9 that you asked for. Do you --

10 MR. GORDON: I -- I accept that. Let's go

11 --

12 MS. ANDREWS: Okay. So --

13 MR. GORDON: Let's move on.

14 MS. ANDREWS: Okay. So we're moving on.
15 Here are the photographs.

16 MR. THORNTON: Let -- let him choose to --
17 how he wants to indenti- --

18 [Reporter requests clarification.]

19 MR. THORNTON: Let counsel decide how he
20 wants -- when he wants them, we can mark them.

21 MS. ANDREWS: I'm going to mark them if
22 you want them now, so it's your choice.

23 MR. GORDON: What do you mean by mark
24 them?

25 MS. ANDREWS: That they are exhibits to

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1 the deposition that can be read and understood at
2 the deposition that we produced them today
3 contemporaneous with the deposition in response to
4 your subpoena.

5 MR. GORDON: I -- I -- I --

6 MS. ANDREWS: It's what the law requires.

7 MR. GORDON: You can mark them as exhibits
8 if you want during your portion.

9 MS. ANDREWS: That's fine. Then he's
10 not -- then I'm not going to give them to you
11 because I -- I have to mark them.

12 MR. GORDON: Oh, come on, Counsel. This
13 is ridiculous.

14 MR. THORNTON: You don't just hand over a
15 bunch of documents willy-nilly and say --

16 MR. GORDON: Really?

17 MR. THORNTON: -- these are responsive.
18 That's -- they -- they get -- they get -- there's
19 certain responses to certain filings.

20 MR. GORDON: Well, when you e-mailed the
21 file on Monday, was that willy-nilly? I -- I don't
22 -- what are -- what are you talking about?

23 MR. THORNTON: It was in response to
24 request No. 1. We didn't have a way to mark it
25 because it was a computer file, but we -- we'll note

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1 it.

2 [Reporter requests clarification.]

3 MR. THORNTON: We will note it, yeah,
4 sure. That's part of the response to Exhibit 1 as
5 well. I mean, if -- if this is a stylistic problem,
6 I -- I understand, but why don't you go ahead with
7 your deposition any way you want to take it.
8 It's --

9 MR. GORDON: We -- we asked for production
10 of documents you've got. We -- we've subpoenaed
11 them. You've got the documents. I have -- I
12 understand you want to make a record that you're
13 complying with the subpoena. That's fine. You
14 know, maybe in California --

15 MR. THORNTON: We just want to identify
16 the --

17 MR. GORDON: -- people challen- --
18 challenge that --

19 MR. THORNTON: -- documents --

20 MR. GORDON: -- but, you know, we're --
21 we're --

22 MR. THORNTON: -- that we're producing so
23 there is a record of what we're producing and what
24 it's in response to.

25 MR. GORDON: Right, but that -- I don't

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1 know that -- you know, that they necessarily need to
2 be exhibits to a deposition that then becomes
3 something that we have to pay to -- to photocopy and
4 it becomes part of a voluminous --

5 MR. ASSAAD: Well, we'll just distinguish
6 and say the Plaintiff's Exhibit 1 to a subpoena and
7 you could go as Defense exhibits and start at 1 as
8 well.

9 MR. GORDON: That's a good idea. You
10 mean, like, a group exhibit?

11 MR. ASSAAD: No. Just, like, this is
12 Plaintiff's Exhibit 1, 2, 3, 4, and then -- then you
13 can start off with --

14 MR. GORDON: We're not -- we -- we haven't
15 been doing Plaintiff's and Defense exhibits. But
16 you know what? Just go ahead mark them. I -- I
17 just want to move this on.

18 MS. ANDREWS: I think you'll --

19 MR. GORDON: I think this is ridiculous.

20 MS. ANDREWS: I think you'll appreciate
21 what I'm trying to support here --

22 MR. GORDON: Yeah, I think --

23 MS. ANDREWS: -- with your subpoena and my
24 responses at the end of the case.

25 So, as I previously mentioned -- let's

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1 start over again. I don't know where the court
2 reporter ended. So 1A is a copy of an article in
3 response to -- to request No. 1 entitled "Simulated
4 human skin sales -- skin scales" by Julianne Lees
5 and W. D. Brighton.

6 Can you mark this?

7 MR. ASSAAD: Sure. Do you want a sticker?

8 MR. THORNTON: You know, I'm just going to
9 mark it with a pen --

10 MS. ANDREWS: That's fine.

11 MR. THORNTON: -- as part of Exhibit 1.
12 (Whereupon Exhibit 1A was marked for
13 identification.)

14 MS. ANDREWS: And I'm going to hand our
15 copies back to you, Jen.

16 So now 1B -- you gotta mark that 1A.

17 MR. THORNTON: Okay.

18 MS. ANDREWS: So this is all response to
19 No. 1.

20 1B is four photographs requested by No. 1.
21 (Whereupon Exhibit 1B was marked for
22 identification.)

23 MS. ANDREWS: It's 1C.

24 Jen, if you'll just keep them in order
25 down there.

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1 MS. ZIMMERMAN: Thank you.

2 MS. ANDREWS: Okay.

3 MR. THORNTON: 1C is entitled "Corrections
4 of Typographical Errors."

5 (Whereupon Exhibit 1C was marked for
6 identification.)

7 MR. THORNTON: 1D is entitled "Summary of
8 data 2010-011 versus 2010-026."

9 (Whereupon Exhibit 1D was marked for
10 identification.)

11 MR. ASSAAD: If you go by Bates numbers.

12 MR. THORNTON: And the Bates Nos.
13 3M00075103 and 104.

14 MS. ANDREWS: Thank you.

15 Response to Request No. 2, there are no
16 responsive documents to Request No. 2.

17 Response to Request No. 3, there are no
18 responsive documents to Request No. 3.

19 Request No. 4, there are no responsive
20 documents to Request No. 4.

21 Request No. 5, there are no responsive
22 documents to Request No. 5.

23 Request No. 6, deponent CV contains the
24 list of publications. Attached is a copy of
25 deponent's CV.

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1 MR. THORNTON: Is that 6?

2 MS. ANDREWS: 6?

3 MR. THORNTON: Or we want to keep it in
4 correspondence with the depo notice and call it 6?

5 MR. ASSAAD: Yeah.

6 (Whereupon Exhibit 6 was marked for
7 identification.)

8 MS. ANDREWS: I'm handing a copy of the --
9 of the deponent's current CV.

10 Request number seven 7, objection.

11 Overbroad and ambiguous as to the terms the deponent
12 considers authoritative. And with regards to the
13 deponent's opinions in the case, documents relied
14 upon have been produced without waiving the
15 objection. Documents relied upon have been
16 produced. Documents that are responsive may be
17 referenced in the Rule 26 report. And such
18 documents, if in the witness' possessions, have been
19 produced. See Response 1.

20 Request No. 8, a copy of deponent's CV is
21 attached.

22 Request No. 9... No. 9, we're
23 attaching --

24 MR. THORNTON: And I'll -- I'll --

25 MS. ANDREWS: Yeah, put them in order.

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1 MR. THORNTON: Thank you.
 2 MS. ANDREWS: We have a number of
 3 documents that are responsive to Request No. 9.
 4 MR. THORNTON: So I'll put 9A. Dated -- a
 5 transmittal, May 14th, 2016.
 6 (Whereupon Exhibit 9A was marked for
 7 identification.)
 8 MS. ANDREWS: And attachment exhibit,
 9 check.
 10 MR. THORNTON: 9B, a transmittal,
 11 September 20th, 2016.
 12 (Whereupon Exhibit 9B was marked for
 13 identification.)
 14 MR. THORNTON: 9C, a transmittal,
 15 March 26th, 2017.
 16 (Whereupon Exhibit 9C was marked for
 17 identification.)
 18 MS. ANDREWS: Put them in order.
 19 MR. THORNTON: 9D.
 20 MR. ASSAAD: Is that the same -- it's not
 21 the same?
 22 MR. THORNTON: August -- same -- same
 23 thing, March --
 24 MS. ANDREWS: 14, 20, 26.
 25 MR. THORNTON: Okay. And then a -- I

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1 think this is an aggregate exhibit, yes. 9D. We're
 2 on D, right?
 3 (Whereupon Exhibit 9D was marked for
 4 identification.)
 5 MS. ANDREWS: Very good.
 6 MR. THORNTON: And that's it.
 7 THE REPORTER: Sir, Mr. Assaad, I'm having
 8 trouble hearing you.
 9 MR. ASSAAD: I'm sorry.
 10 THE REPORTER: Do you want it off the
 11 record?
 12 MR. ASSAAD: Yeah, that was just a
 13 communication between counsel.
 14 9D is a aggregation of bills. I think
 15 those are Bates'd.
 16 MS. ANDREWS: Let me just look at them.
 17 Okay. Documents in respo- -- in response
 18 to Request No. 9, retention bills.
 19 Request No. 10, same response. Same
 20 documents as No. 9.
 21 No. 11, there are no responsive documents
 22 to this request.
 23 No. 12, there are no responsive documents
 24 to this request.
 25 No. 13, there are no responsive documents

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1 to this request.
 2 No. 14, there are no responsive documents
 3 to this request.
 4 No. 15, there are no responsive documents
 5 to this request.
 6 No. 16, there are no responsive documents
 7 to this request.
 8 17, there are no responsive documents to
 9 this request.
 10 18, the response is report and all
 11 materials contained in the report.
 12 Request No. 19, there are no responsive
 13 documents to this request.
 14 No. 20, the response to Request No. 20 is
 15 all nonproprietary information has been furnished.
 16 (Discussion off the record.)
 17 MS. ANDREWS: I did, yes.
 18 The only other thing that we were hoping
 19 to ask counsel about that pertains to this
 20 proceeding is that Ms. Zimmerman informs me that as
 21 recently as yesterday, the Court entered an order
 22 regarding rebuttal reports. So we want the record
 23 to reflect that we will be rebutting at trial a --
 24 numerous reports that have been served on the
 25 plaintiffs. Just so it's abundantly clear, there

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1 will be no rebuttal reports. So, for instance,
 2 Dr. Abra- -- Abraham's report, who is present here
 3 today, will be rebutted in testimony at trial, as
 4 where -- as well as a number of other experts that
 5 we can't identify at this time.
 6 MS. ZIMMERMAN: Just to clarify for the
 7 record, the hearing was this morning in Minneapolis.
 8 I think it started at 9:30 Central. I don't know if
 9 an order has officially been entered, but the judge
 10 ruled from the bench that the ability to rebut will
 11 be preserved for trial.
 12 Finally, one other issue is that to the
 13 extent that the subpoena calls for any exhibits that
 14 will be used at trial, the plaintiffs will just
 15 formally object to that and reserve the right to
 16 identify any exhibits, including demonstratives, in
 17 connection with the Court's forthcoming scheduling
 18 order.
 19 MS. ANDREWS: So that completes the
 20 response to your subpoena, sir, and comments for the
 21 record about reports, et cetera. And the witness
 22 has been sworn.
 23 MR. GORDON: I'm -- am I missing something
 24 here on your 9?
 25 MS. ANDREWS: I hope not. Let me see.

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1 MR. GORDON: A, B, C. It looks like
2 there's a gap between September 2016 and
3 February 2017.

4 MS. ANDREWS: Why don't you hand them
5 back. Let me look at them. Let me hand them to
6 Ms. Zimmerman.

7 Is everybody okay with the temperature in
8 here? It feels like it's going to get warm. Are
9 you okay?

10 THE REPORTER: I'm beginning to get cold,
11 so hopefully we don't have to --

12 MS. ANDREWS: It's usually hot on that
13 end, because all the equipment's there.

14 THE WITNESS: Yeah.

15 MS. ANDREWS: So just let me know,
16 Doctor --

17 THE WITNESS: Sure. Sure.

18 MS. ANDREWS: -- if you're --

19 THE WITNESS: Sure.

20 MS. ANDREWS: -- uncomfortable.

21 THE WITNESS: Sure. Thank you.

22 MS. ZIMMERMAN: Counsel, to the extent
23 it -- I -- it seems that there may be -- we -- we
24 have searched our records and these are the invoices
25 that we have, and we've produced all checks that

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1 have been provided. So I believe that this is
2 complete, but we are happy to reexamine the issue.
3 There are checks as -- if you look in 9D, that are
4 dated in the fall of 2016, if that's the gap that
5 you -- I think you may have identified.

6 MR. GORDON: Well, yeah. I mean, I
7 just -- so there are no -- there was no work done
8 between September 19th, 2016, and February 8th,
9 2017?

10 MS. ZIMMERMAN: No, that's not -- that's
11 not what I said. But the invoices that have been
12 provided have been -- or have been submitted to
13 counsel have been reimbursed and they have been
14 provided to counsel in connection with the subpoena.

15 MR. GORDON: Okay. But I'm not asking
16 about -- about the checks. There -- you've --
17 you've produced three invoices. One that says it
18 covers the period from April 3rd, 2016, to May 14th,
19 2016. Then one from -- well, I guess there are a
20 couple of gaps. Then one from July 23rd, 2016, to
21 September 19th, 2016. And another one from
22 February 8th, 2017, to March 23rd, 2017.

23 MS. ANDREWS: Can I make a suggestion?

24 MR. GORDON: Yeah.

25 MS. ANDREWS: Let's -- let's maybe handle

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1 this at a break and we'll go through them carefully
2 and see if there's any gaps and any more information
3 that might be missing. We just produced the file
4 that was sent to us, sir, so I apologize if there
5 are gaps, but we're happen to be compliant with the
6 subpoena request, and I think we just have our of --
7 off-the-record discussion about it.

8 MR. GORDON: Well, I -- actually, Counsel,
9 you've kind of convinced me how important it is to
10 have things on the record when it comes to
11 responding to subpoenas.

12 MS. ANDREWS: It's your choice.

13 MR. GORDON: There's a check --

14 MS. ANDREWS: It's your choice, Counsel.

15 MR. GORDON: Well, there's a --

16 MS. ANDREWS: You wanted it off the record
17 before.

18 MR. GORDON: There's a check --

19 MS. ANDREWS: Now you want it on the
20 record.

21 MR. GORDON: Yeah. There's a --

22 MS. ANDREWS: Have it your way.

23 MR. GORDON: Yeah. There's a check
24 attached to each one of these three invoices that I
25 just referenced, but then there's a stack of four

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1 checks, each bearing different dates, but each for
2 the amount of \$32,500, so that's -- that's a total
3 of \$130,000. And there are -- there are no --
4 there's no corresponding invoice. There's nothing
5 that -- from which I can examine Dr. Elghobashi
6 about, what this 160 --

7 MS. ANDREWS: Well, you have the witness
8 here before you who --

9 MR. GORDON: -- 130,000 is for.

10 MS. ANDREWS: -- who sent the invoices.

11 [Reporter requests attorneys speak one
12 at a time.]

13 MS. ANDREWS: I apologize. The witness is
14 here who produced -- provided the invoices, so
15 perhaps he can shed some light on it if you choose
16 to inquire. I don't think counsel --

17 MR. GORDON: So you're --

18 MS. ANDREWS: -- can do anything more for
19 you today.

20 MR. GORDON: Okay. I just want -- you're
21 -- so you're representing that these three invoices
22 marked 9A, 9B and 9C are the only invoices you have?

23 MS. ANDREWS: That's what I've been given
24 to -- in response to the subpoena, sir.

25 MR. GORDON: By whom?

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1 MS. ANDREWS: By the custodian of those
2 files. And I'm not -- my deposition isn't going
3 forward today --

4 MR. GORDON: Well, I --

5 MS. ANDREWS: -- either. I --

6 MR. GORDON: -- I didn't mean --

7 MS. ANDREWS: -- asked for them from the
8 committee. This is what I received. This is what I
9 went on the record to give to you today. So if you
10 have questions of the witness and not of counsel,
11 I'll be happy to have him answer any questions about
12 it.

13 MR. GORDON: Well, I'm just trying to
14 understand who responded to this subpoena. Is this
15 Dr. Elghobashi provided the -- these responses, or
16 did somebody else on the plaintiff's steering
17 committee provide these responses?

18 MS. ANDREWS: I don't think that's a
19 question that I can answer for you, sir.

20 MR. GORDON: You can't answer -- you've
21 just gone through an elaborate thing to tell me
22 about everything you're producing, but you can't
23 even tell me where the documents you're producing
24 came from?

25 MS. ANDREWS: I don't think that I have a

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1 responsibility to answer your questions. I've done
2 the best I can responding to your subpoena. You
3 have the documents. Go forward, sir.

4 MR. GORDON: Got it.

5 EXAMINATION

6 BY MR. GORDON:

7 Q. Okay. Let's start.

8 Good morning --

9 A. Good morning.

10 Q. -- Dr. Elghobashi. And it is basic- --
11 just still morning. I apologize for all the back
12 and forth there.

13 You, sir, have never had your deposition
14 taken before?

15 A. Never.

16 Q. Okay.

17 A. It's a new experience.

18 Q. I'm sure it's one you're going to want to
19 relive over and over again and do it -- do as often
20 as you possibly can.

21 If you need to take a break for any
22 reason --

23 A. Sure.

24 Q. -- just, you know, say so and --

25 A. Thank you.

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1 Q. Everything you say is being transcribed by
2 the court reporter.

3 A. Sure.

4 Q. It's also being videotaped. Because of
5 that, there's a -- there's sort of an artificial
6 communication --

7 A. Okay.

8 Q. -- limitation.

9 A. Sure.

10 Q. When people talk, we -- we tend to talk --
11 A. Okay.

12 Q. -- over each other. I have to wait until
13 you're done with your answer. You need to wait
14 until I'm done with my question. If Ms. Andrews
15 offers a -- an objection, we both have to wait until
16 she has completed her objection. That's more for
17 the court reporter.

18 A. Sure.

19 Q. She -- she can't take down two people
20 talking at once.

21 The other big rule, and it makes it sort
22 of un- -- different than normal human conversation,
23 is you have to give clear verbal answers like "yes,"
24 "no." Not "uh-huh," "uh-uh," or a shake or nod of
25 the head. "Uh-huh" or "uh-uh" or a shake or a nod

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1 of the head will communicate to me, and I'll
2 probably understand what you're saying. She just
3 can't trun- -- transcribe it. So there's -- I
4 just -- with that background of artificiality, I
5 just want -- want -- want you to be aware of that.

6 If you don't understand a question that I
7 ask or don't hear it or don't hear part of it,
8 please let me know and -- so we can make sure that
9 the -- the question is clear to you. Okay?

10 A. Sure.

11 Q. Okay. When -- you -- you're a professor
12 at University of California at Irvine?

13 A. Correct.

14 Q. And are you -- I'm sorry. Are you
15 professor or professor emeritus? You're still --

16 A. I'm still.

17 Q. Still active. Okay. But you -- you've
18 been there for quite a while, right?

19 A. Correct.

20 Q. I don't mean to imply that you're old, I'm
21 just --

22 A. I am old.

23 Q. Yeah, so am I. It happens.

24 The -- and your -- your particular area
25 of -- of expertise is computational fluid dynamics;

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1 is that correct?

2 A. Correct.

3 Q. Okay. Something you've been doing for
4 several decades, right?

5 A. Correct.

6 Q. Okay. When were you first contacted about
7 participating in this litigation as a -- as an
8 expert witness?

9 A. In July 2016.

10 Q. Well, let's -- you know what? Let's start
11 with these invoices and see if we can clear up my
12 confusion. Let me show you what your -- what's
13 already been marked helpfully as Exhibit 9A. And
14 this looks like an invoice from you from May 14th,
15 2016, covering April 3rd to May 14th, 2016.

16 A. I have to get my glasses. I'm sorry. I
17 didn't know I was going to read.

18 Yes.

19 Q. Okay. So that appears to be before
20 July 2016, so it's --

21 A. Right, yes. I meant we met in July, but I
22 was approached before, of course. May -- let's see
23 here. So it would be -- I don't recall. Maybe
24 April or something.

25 Q. Okay. And so you -- the first contact

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1 would have been --

2 A. For April -- let's just say April 3, yes.
3 It's written here, April 3.

4 Q. And you were called; is that right?

5 A. Correct.

6 Q. And -- and what -- you know, what -- what
7 is it you under -- you were asked to do initially?

8 A. Anne, Ms. Anne Andrews, said that we
9 have -- we have a -- a problem with an operating
10 room device and would like to see if I can help
11 explaining it.

12 Q. In your -- that first invoice, Exhibit 9A,
13 you sent -- you say that you spent three hours
14 studying the Bair Hugger system --

15 A. Correct.

16 Q. -- and conducting discussions with Anne
17 Andrews and colleagues.

18 What in -- if -- what did you do initially
19 to study the Bair Hugger system?

20 A. So reading information on the web from 3M
21 about the device.

22 Q. Anything other than what 3M posted on the
23 web?

24 A. There could be other papers that I looked
25 at from NIH or other -- I mean, I don't recall, but

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1 it would be papers that I Googled.

2 Q. Okay. Did you physically see a Bair
3 Hugger unit during this period of time?

4 A. During this period of time, no.

5 Q. Okay. Have you -- have you seen a Bair
6 Hugger?

7 A. Oh, definitely, yeah.

8 Q. When was the first time you saw one?

9 A. I -- I -- can I ask them about the
10 meeting? It was in -- at UCI.

11 MS. ANDREWS: Unfortunately, you cannot
12 ask me --

13 THE WITNESS: Okay.

14 MS. ANDREWS: -- to help you with any
15 answer.

16 THE WITNESS: Okay.

17 MS. ANDREWS: Or you can't ask questions
18 of me.

19 THE WITNESS: Okay.

20 MS. ANDREWS: Only counsel can ask you
21 questions.

22 THE WITNESS: Oh, sure. So it would be a
23 meeting --

24 [Reporter requests attorney and witness
25 speak one at a time.]

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1 MS. ANDREWS: Hang on a second,
2 Dr. Elghobashi. Just answer counsel's question --

3 THE WITNESS: Okay.

4 MS. ANDREWS: -- to the best of your
5 recollection.

6 THE WITNESS: Okay.

7 MS. ANDREWS: And if you don't understand
8 or you need him to clarify it, he will certainly
9 rephrase it for you.

10 THE WITNESS: Okay.

11 MS. ANDREWS: The idea is to get a --

12 THE WITNESS: Thank you.

13 MS. ANDREWS: -- good record --

14 THE WITNESS: Correct.

15 MS. ANDREWS: -- and that everyone
16 understands the questions.

17 THE WITNESS: So we had a meeting in -- at
18 UCI where the counsel brought a Bair Hugger and a
19 blanket and, yes, that will be. But I don't recall
20 the date of the meeting.

21 BY MR. GORDON:

22 Q. Maybe this will help. Let me show you
23 your invoice 9B which covers the period July 23rd to
24 September 19th, 2016; is that correct?

25 A. Okay. So this is -- okay, the -- the July

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1 was referring to this meeting that you asked. Okay.
 2 Reading, meeting. So in August -- on August 28th,
 3 we met at UCI, and at that time, that was the first
 4 time I see the Bair Hugger and the blanket and we
 5 made a test at that time.

6 [Reporter requests clarification.]

7 THE WITNESS: A test.

8 BY MR. GORDON:

9 Q. What test did you do at that time?

10 A. So we put Gabriel on the table like this,
 11 a conference room, and we cover him with the Bair
 12 Hugger blanket and we activated the -- the blower,
 13 the BH blower.

14 Q. Okay. I'm going to anticipate this
 15 because I think this is -- is that Exhibit 8, is
 16 that the number you wrote?

17 MS. ANDREWS: That's correct.

18 THE WITNESS: That's something else. Then
 19 this is -- we --

20 MS. ANDREWS: There's no question pending,
 21 Doctor.

22 THE WITNESS: Okay. That is --

23 MR. GORDON: I'm just --

24 THE WITNESS: That's something else.

25 BY MR. GORDON:

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1 Q. I'm -- I'm showing Exhibit 8, a series of
 2 four photographs that were --

3 A. Correct, yes.

4 Q. -- produced to us this morning.

5 A. Uh-huh.

6 Q. What -- what are these photographs of?

7 A. These were in operating room in Santa
 8 Monica, California. I don't know the date, but it
 9 could be September 2016. And we put a volunteer
 10 patient on an operating --

11 MS. ANDREWS: He doesn't have a question
 12 pending.

13 THE WITNESS: Okay.

14 MS. ANDREWS: You have to wait for him --

15 THE WITNESS: Okay.

16 MS. ANDREWS: -- to direct you --

17 THE WITNESS: Okay. Okay.

18 MS. ANDREWS: -- to what he wants to know
 19 about the photos.

20 THE WITNESS: Okay.

21 BY MR. GORDON:

22 Q. Why don't you tell me what those photos
 23 depict.

24 A. So in an operating room, we asked a
 25 registered nurse to set up the operating table and a

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1 blanket and the drapes as she usually does, and we
 2 asked the volunteer patient to lie down and we run
 3 the BH blower.

4 Q. When you say "we," who else was present?

5 A. Ms. Anne Andrews and John and another
 6 counsel, Leila -- I don't know her last name.

7 Q. Anyone other -- besides lawyers and the --
 8 this RN?

9 A. The RN, they were -- there was a company.
 10 We wanted to see if they can do a CAD for this room.

11 MR. GORDON: So we're up to Exhibit 12.

12 (Whereupon Exhibit 12 was marked for
 13 identification.)

14 BY MR. GORDON:

15 Q. I'm going to show you what -- what I've
 16 marked as Exhibit 12. Does that appear to be a copy
 17 of your expert report in this matter? Is that -- is
 18 this your expert report, Exhibit 12?

19 A. Correct.

20 Q. Okay.

21 A. It looks like.

22 Q. Okay. And if you turn to page 10 of
 23 Exhibit 12, there appears to be a -- a computer --

24 A. Yes.

25 Q. -- assisted drawing --

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1 A. Yes.

2 Q. -- at the bottom. Is -- was this done by
 3 the company that you were -- you're talking about,
 4 in the lower left-hand corner, Figure 4(a)?

5 A. No, that -- that is not done by that
 6 company, no.

7 Q. Did that company do any --

8 A. No, they -- they couldn't.

9 Q. Okay.

10 A. They couldn't.

11 MS. ANDREWS: Wait. You need to wait for
 12 him to --

13 THE WITNESS: Oh, okay.

14 MS. ANDREWS: -- finish his question.

15 THE WITNESS: Okay. Okay.

16 MR. GORDON: Well --

17 MS. ANDREWS: Objection. Calls for
 18 attorney work product.

19 You can answer.

20 BY MR. GORDON:

21 Q. Well, what was your understanding of why
 22 they couldn't do it? Was it a computer problem
 23 or --

24 A. They were using -- yeah, but --

25 MS. ANDREWS: If you know.

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1 THE WITNESS: No. No, they were not.
 2 Yeah.
 3 BY MR. GORDON:
 4 Q. Okay. Just -- just to save counsel some
 5 time and effort, every question I ask you, I only
 6 want what you know. So if you don't know something,
 7 then you can say, "I don't know."
 8 A. Okay.
 9 Q. But if you do know, then you can answer.
 10 A. Sure.
 11 Q. This way, your counsel won't have to --
 12 A. Okay. Okay.
 13 Q. -- you know, say "if you know" --
 14 A. Okay.
 15 Q. -- anymore. Okay?
 16 The picture on the Exhibit 12, page 10, I
 17 guess Figure 4(b), where did that picture come from?
 18 A. I don't recall. It could be Gabriel,
 19 the counsel Gabriel.
 20 MS. ANDREWS: If you don't recall, you
 21 don't recall.
 22 THE WITNESS: I don't -- okay. I don't
 23 recall.
 24 MS. ANDREWS: See, Counsel also doesn't
 25 want me to tell you this, but I really am going

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1 you -- you can answer. And --
 2 A. Uh-huh. Okay.
 3 Q. -- if you have some basis for -- for
 4 thinking an answer might be something -- for
 5 example, this picture, did you take the picture?
 6 A. No.
 7 Q. Did you, yourself, go out to, you know, a
 8 source like Getty Images or go online --
 9 A. No.
 10 Q. -- and find the picture?
 11 So someone else provided you with this
 12 picture; is that right?
 13 A. Someone else, yes.
 14 Q. Okay. And it wasn't a grad student or --
 15 A. No.
 16 Q. It wasn't somebody, you know, working
 17 under your direction who provided this picture to
 18 you?
 19 A. Correct.
 20 Q. It was one of the attorneys who provided
 21 it to you; is that right?
 22 MS. ANDREWS: Objection. Calls for
 23 speculation. Attorney work product.
 24 THE WITNESS: I don't recall.
 25 BY MR. GORDON:

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1 to --
 2 THE WITNESS: Uh-huh.
 3 MS. ANDREWS: -- this one time, tell you.
 4 Guessing is not evidence.
 5 THE WITNESS: Okay.
 6 MS. ANDREWS: So if you're speculating --
 7 THE WITNESS: Okay.
 8 MS. ANDREWS: -- when you're not sure,
 9 it's --
 10 THE WITNESS: Right.
 11 MS. ANDREWS: -- not admissible to the
 12 Court.
 13 THE WITNESS: Uh-huh.
 14 MS. ANDREWS: So he doesn't want you to
 15 guess or speculate.
 16 THE WITNESS: Okay.
 17 MS. ANDREWS: And nobody wants you to.
 18 THE WITNESS: Sure.
 19 MS. ANDREWS: Thank you.
 20 THE WITNESS: Thank you.
 21 BY MR. GORDON:
 22 Q. Yeah. And -- and again, so she doesn't
 23 have to keep doing that, if a question I ask you
 24 calls for you to guess, tell me that, that you can't
 25 answer without guessing. Otherwise, you know,

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1 Q. You don't. Okay.
 2 Who besides the attorneys that you've
 3 worked with has provided you with any information
 4 that you've incorporated into your report?
 5 A. No one -- I may have found it on the web.
 6 I'm -- I'm just trying to remember as much as I can,
 7 right?
 8 Q. Okay. My question, though, goes to --
 9 A. Yeah.
 10 Q. -- who -- who assisted you in -- in
 11 compiling information to go into your report?
 12 MS. ANDREWS: Objection. Work product.
 13 Calls for attorney work product communication
 14 regarding expert reports.
 15 THE WITNESS: I don't recall. I may have
 16 obtained them by myself from the web.
 17 BY MR. GORDON:
 18 Q. I'm -- I'm speaking more broadly.
 19 A. Oh, okay.
 20 Q. Maybe -- your report -- I mean, I assume
 21 you had some assistance in -- in, you know,
 22 preparing it, typing it, things like that.
 23 A. Uh-huh. Okay.
 24 Q. You didn't do it all by yourself, right?
 25 A. Yeah.

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1 MS. ANDREWS: Yeah, the -- Counsel, let's
2 just be clear. The new rules do not permit any --
3 and I believe that these are the rules that have
4 been in play in this case with your witnesses and
5 will be with your witnesses, that we are not -- and
6 are not required to go into background
7 conversations, drafts, communications with counsel
8 are all off limits and I will be instructing him not
9 to answer unless I hear a question that's properly
10 posed to the witness.

11 BY MR. GORDON:

12 Q. I -- I'm not asking you if your -- if the
13 attorneys you're -- you're working for typed up
14 your -- your report. I'm assuming you didn't sit
15 yourself at a -- at a keyboard and type up the
16 report.

17 MS. ANDREWS: Objection. Argumentive.
18 Calls for speculation.

19 Can you -- do you want that question back?

20 THE WITNESS: I would -- I would like to,
21 yes.

22 MS. ANDREWS: Don't answer any question
23 that you have not understood. And if I object or
24 counsel has comments about the question, be sure and
25 have it read back so it's clear in your mind before

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1 you answer it.

2 THE WITNESS: I typed this report.

3 BY MR. GORDON:

4 Q. Okay. Did you have any graduate students
5 assist you in any aspect of this report?

6 A. Yes.

7 Q. Who?

8 A. That would be Dr. Apte, A-P-T-E. He's a
9 professor.

10 Q. Is he at Stanford?

11 A. He used to be at Stanford. He's now at
12 Oregon State.

13 Q. Oregon State. Okay.

14 And what did Dr. Apte -- what were -- what
15 was Dr. Apte's contribution to the -- to your
16 report?

17 A. Running the computer program.

18 Q. The -- the code for the model?

19 A. Correct, yes.

20 Q. Okay. And, in fact, the -- the code that
21 was used is proprietary code of Dr. Apte's, correct?

22 A. Correct.

23 MS. ANDREWS: Yeah.

24 BY MR. GORDON:

25 Q. So Dr. Apte actually ran the -- the

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1 model --

2 A. Correct.

3 Q. -- correct?

4 Based on boundary conditions that you
5 provided to him, right?

6 A. Correct.

7 Q. Okay. Did Dr. Apte participate in
8 actually dev- -- developing the -- the boundary
9 conditions?

10 A. No. I did.

11 Q. Okay. Was he physically present, you
12 know, in Santa Monica when you went into that
13 operating room?

14 A. No.

15 Q. Was he physically present for any aspect
16 of this, or was this just something where he, up in
17 Oregon, ran the -- ran the code?

18 A. So we met few times.

19 Q. Where?

20 A. At APS meet- -- American Physical Society
21 meeting in Portland.

22 Q. Okay. When -- do you know when that was?

23 A. This was in November, before Thanksgiving.

24
25 Q. Now, did he charge for his work?

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1 A. Correct.

2 Q. Did he bill the plaintiffs separately for
3 that?

4 A. No. He -- only with me.

5 Q. Okay. And did -- did you then bill the
6 plaintiffs' counsel for Dr. Apte's work?

7 A. Correct.

8 Q. Okay. Let's -- we -- we're jumping around
9 a little bit because I'm just trying to put things
10 together.

11 A. Yeah.

12 Q. 9C is the -- is the third invoice that was
13 provided this morning. What -- and that -- I --
14 what -- what's the period of time that that covers?

15 A. February 17 to March 17.

16 Q. 2017, right?

17 A. Correct.

18 Q. Okay. So in those three invoices, 9A, 9B
19 and 9C, I don't see any reference to a payment for
20 Dr. Apte or any -- any other outside consultant.
21 Did I -- did I miss it or would -- would there have
22 been some other invoice?

23 A. Right. I -- I paid Dr. Apte. I paid him
24 after I get the funds from the counsel.

25 Q. Okay. But in order to get the funds from

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1 the counsel, did you submit any kind of a written
2 statement?

3 A. Correct, I did.

4 Q. But -- and it's not one of those?

5 A. It's not. It's not one of those, no.

6 Q. Okay.

7 MS. ANDREWS: Counsel, I do apologize. I
8 have a document to hand you. I don't mean to
9 interrupt, but this is response to Item No. 9. It
10 was just handed to me and I forgot to put it in the
11 files, but that is a document responsive to Request
12 No. 9 that's germane to your line of questioning.

13 MR. THORNTON: That's 9E at this point.

14 (Whereupon Exhibit 9E was marked for
15 identification.)

16 MR. GORDON: E as in Edward?

17 MS. ANDREWS: Correct.

18 BY MR. GORDON:

19 Q. So to, I guess, this new document, the 9E,
20 that --

21 A. Correct.

22 Q. Does that --

23 A. Yeah, that's --

24 Q. -- fill in the gap?

25 A. Correct.

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1 project cost in -- listed in 9E --

2 A. Yes.

3 Q. -- is that right?

4 A. Correct.

5 Q. Okay. Other than the -- the checks for
6 100 and -- the total \$130,000 and the three checks
7 that are attached to the invoices, 9A, B, and C, are
8 -- were there any other --

9 A. No.

10 Q. -- payments?

11 A. No.

12 Q. Okay. Were there any other invoices or
13 written submissions that you made re- -- to seek
14 payment?

15 A. I have to go to my records, but seem -- it
16 seems, yeah.

17 Q. Okay.

18 A. The major one is this one, yeah, on the
19 record.

20 Q. And by "this one," you're -- you're --
21 just so the record's clear, you -- you pointed to
22 9E?

23 A. Correct.

24 Q. Okay. Okay. Now, in this one, 9E, you
25 say, "The following data will be provided by

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1 Q. Okay. So you -- you -- basically, you
2 billed on a project basis?

3 A. Correct.

4 Q. And, in fact, 9D is a series of four
5 checks that --

6 A. Correct, they were -- yes.

7 MS. ANDREWS: Let him finish the question.

8 THE WITNESS: Oh, I'm sorry.

9 MS. ANDREWS: It takes a little bit --

10 THE WITNESS: Okay.

11 MS. ANDREWS: -- of time to get in the
12 rhythm --

13 THE WITNESS: Okay.

14 MS. ANDREWS: -- and he just needs to get
15 his question finished because oftentimes --

16 THE WITNESS: Okay.

17 MS. ANDREWS: -- they change meaning at
18 the end in the fray.

19 THE WITNESS: Okay. Okay.

20 MS. ANDREWS: So just be patient and he'll
21 be patient and listen to your answer.

22 THE WITNESS: Sure.

23 BY MR. GORDON:

24 Q. So 9D is a series of four checks that
25 total \$130,000, and that, I -- I believe, is the

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1 Gabriel: 1, The dimensions and locations of all
2 items and medical staff in the room. (tables, lamp,
3 heater, PC, surgeon, nurses, et cetera.) 2, the
4 dimensions and locations of the inlet and exit air
5 grilles. 3, the air inflow rates at the ceiling
6 grilles and the outflow rates at the lower grilles.
7 4, the electric power output of the lamps, PC, et
8 cetera in the room. 5, the air inflow rate to the
9 blanket blower, and the temperature of the air
10 leaving the blanket. 6, a drawing of the blanket
11 and the locations of the drape edges near the
12 floor."

13 Do you see where I read that?

14 A. Yes.

15 Q. Who is Gabriel?

16 A. The counsel sitting there.

17 Q. Mr. Assaad?

18 A. Right, yes.

19 Q. Okay. And did that in -- did Mr. Assaad,
20 in fact, provide the -- those data points to you?

21 MS. ANDREWS: Objection. Compound.

22 THE WITNESS: Okay. Not all the data --
23 not all the items, no. Not all.

24 BY MR. GORDON:

25 Q. Okay. Tell -- please tell me which ones

1 he did not provide to you.

2 A. The dimensions of the rooms, the location
3 and inlets of the grille, air inflow, electric
4 outlet, air inflow rate to the blanket blower.
5 Probably this maybe from the specification of the
6 Bair Hugger, so No. 5. Okay. And No. 6, a drawing
7 of the blanket, location of the drape edges. A
8 drawing of the blanket. So Gabriel provided
9 specification of the Bair Hugger and a drawing of
10 the blanket, 5 and 6.

11 Q. So the only things on this list that --

12 A. Correct.

13 Q. -- Mr. Assaad provided --

14 MS. ANDREWS: Let him answer -- let him
15 ask the question.

16 THE WITNESS: Okay.

17 MS. ANDREWS: Let's start over.

18 THE WITNESS: Okay.

19 MS. ANDREWS: Thank you, Counsel.

20 MR. GORDON: It's -- it's hard, I know.

21 BY MR. GORDON:

22 Q. The only things on this list of 1 through
23 6 on page 9 -- or on Exhibit 9E that Mr. Assaad
24 provided to you were Nos. 5 and 6; is that correct?
25 A. Correct.

1 conditions that you provided to Dr. Apte?

2 A. That video, we took only the dimensions of
3 the room only, 7 meter by 7 meter.

4 MS. ANDREWS: Jen, thanks.

5 BY MR. GORDON:

6 Q. If I could direct your attention to page
7 32 of Exhibit 12, your expert report. And under
8 the -- I guess this is Section 3.4, the boundary
9 conditions --

10 A. Correct.

11 Q. -- begins on page 28.

12 A. Yes.

13 Q. In the middle of the page, you -- you say,
14 "The temperature of the hot air at the BH blower
15 outlet is prescribed equal to 109 Fahrenheit (42.77
16 Celcius) and the temperature of the air leaving the
17 drape edge is set equal to 106 Fahrenheit --

18 A. Correct.

19 Q. -- (41.11 --

20 A. Correct.

21 Q. -- C) according to 3M video at," and then
22 you -- there's a URL for a YouTube video; is that
23 right? Do you see that section?

24 A. Yeah, I do.

25 Q. Okay. So did you use the temperature

1 Q. Okay. And that in- -- it included the
2 temperature of the air leaving the blanket?

3 A. The --

4 MS. ANDREWS: Wait. Let him hand it back
5 to you.

6 THE WITNESS: Okay. The temperature of
7 air leaving the blanket, he provided a 3M table. I
8 think it's one of the exhibits that you took. 41C,
9 I don't remember. 41 or something.

10 BY MR. GORDON:

11 Q. Okay. And in your report, you -- you make
12 a reference to a YouTube video. Do you recall it?

13 A. For -- yeah, from 3M.

14 Q. Right.

15 A. And that's --

16 MS. ANDREWS: Wait, wait.

17 THE WITNESS: Okay.

18 MS. ANDREWS: There's no question pending.

19 THE WITNESS: Yes.

20 BY MR. GORDON:

21 Q. I -- so you -- is that something that you
22 reviewed yourself, the 3M video?

23 A. Definitely, yes.

24 Q. And that's -- that's something that you
25 relied on in -- in developing the boundary

1 information that you've -- that's set forth on 32
2 from the YouTube video in any way in connection with
3 developing the boundary conditions?

4 MS. ANDREWS: Objection. Vague and
5 ambiguous.

6 THE WITNESS: 41 degrees Centigrade, the
7 air exits from the blanket.

8 BY MR. GORDON:

9 Q. I -- I may have misunderstood you, and if
10 I --

11 A. Okay.

12 Q. -- I did, I apologize. But I -- I thought
13 you had said that the only thing you used from the
14 3M YouTube video in developing the boundary
15 conditions --

16 A. Yes.

17 Q. -- were the room dimensions. So my -- my
18 question is, did you also use information about the
19 temperature from that 3M video --

20 MS. ANDREWS: Objection. Asked and
21 answered.

22 BY MR. GORDON:

23 Q. -- in developing your boundary conditions?

24 MS. ANDREWS: Objection. Misleading.

25 THE WITNESS: Could you repeat the

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1 question again, please?

2 BY MR. GORDON:

3 Q. Well, I -- I'm trying to understand where
4 you got the information that you used for your
5 boundary conditions with respect to temperature.
6 And I want to make sure I'm -- I -- I under- --
7 understand where you got that.

8 A. Okay.

9 Q. I thought I heard you say earlier that the
10 only thing you got from the YouTube video were the
11 dimensions of the room. Reading this, it seemed
12 that you also got the temperature conditions.

13 MS. ANDREWS: Objection. Mischaracterizes
14 prior testimony.

15 BY MR. GORDON:

16 Q. So I'm just -- I just want to be clear. I
17 want to -- if you turn to page 33, under Table 2,
18 under temperature of hot air leaving the drape
19 edge --

20 A. Uh-huh, yes.

21 Q. -- you have 41.11 degrees --

22 A. Correct.

23 Q. -- Celcius, and that appears to be the
24 same number that you list on page 32 as having been
25 "according to 3M video."

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1 Counsel. It's this exhibit that we gave to you
2 earlier to -- for the record.

3 THE WITNESS: Yeah.

4 MS. ANDREWS: Our 3M tables.

5 BY MR. GORDON:

6 Q. Okay. So you're -- what you're referring
7 to just a moment ago as the verification of the --

8 A. Correct.

9 Q. -- 41.11 is Exhibit --

10 A. Uh-huh.

11 Q. -- is that 1D?

12 MS. ANDREWS: It was previously marked
13 when we gave it to you as --

14 THE WITNESS: 1D.

15 MS. ANDREWS: -- 1D.

16 THE WITNESS: Like David.

17 BY MR. GORDON:

18 Q. Okay.

19 A. And -- yes. So here, the new model, 750,
20 and then the blanket, 522, and you can see -- yeah,
21 it's even -- it even reaches 42.4. It's higher,
22 yeah.

23 BY MR. GORDON:

24 Q. Is it -- before you hand me -- hand that
25 back to me, can you -- can you show me, is there

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1 A. Yes.

2 Q. Okay. So where did you get the 42 -- the
3 -- where did you get the -- the temperature of
4 41.11 degrees Celcius for the temperature of hot air
5 leaving the drape edge as you list on Table 2?

6 A. Okay. From the 3M video, yes.

7 Q. Okay. So that -- and that would -- that's
8 one of the boundary conditions that you provided to
9 Dr. Apte, correct?

10 A. Yeah, we usual -- okay, yes.

11 Q. Okay. Did you do anything to verify that
12 41.11 degrees Celcius temperature as being a -- a
13 correct boundary condition for the temperature of
14 hot air leaving the drape edge?

15 A. Yes. There is a 3M table, which is one of
16 the exhibits, that showed the model and the blanket
17 and -- and it shows sometimes even higher than 41,
18 like, 41.6.

19 Q. When you say one of the exhibits, it's
20 something in your report or --

21 A. No. It's -- was given you today.

22 Q. Oh, okay.

23 If you see it, call out, because I --

24 THE WITNESS: This one.

25 MS. ANDREWS: You can thank me now,

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1 anywhere on Exhibit 1D that indicates that the --
2 any of the temperatures listed there are a
3 reflective of the temperature of air that would be
4 exiting the edge of a drape over the patient and the
5 Bair Hugger blanket?

6 A. None.

7 Q. Okay. And on the YouTube video, is it
8 your recollection that the temperatures -- the
9 temperature that was given of 106 degrees
10 Fahrenheit, that the -- that -- is it your
11 recollection that the video indicated that that was
12 the temperature of the air leaving the drape edge?

13 A. I don't recall the video, of what it said
14 on the video. I do not recall.

15 Q. Okay. Did you do any measurements with a
16 -- you know, take -- take temperatures, you know,
17 with a thermocouple or a -- some -- some sort of
18 a --

19 A. It --

20 Q. -- instrument?

21 MS. ANDREWS: Let him finish. Let him
22 finish.

23 THE WITNESS: No.

24 BY MR. GORDON:

25 Q. Okay. Going back to those four

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1 photographs -- what was that exhibit?
 2 MS. ANDREWS: Eight.
 3 THE WITNESS: Eight.
 4 BY MR. GORDON:
 5 Q. Exhibit 8. Those were taken at UC Irvine?
 6 A. Nine -- no.
 7 Q. Oh, I'm sorry. Where were those photos
 8 taken?
 9 A. Santa Monica.
 10 Q. Oh, I'm sorry. Okay. So those
 11 photographs --
 12 A. From Santa Monica.
 13 Q. I see. Okay. How -- how was it that you
 14 gained access to an operating room at -- in Santa
 15 Monica? Is that something you arranged?
 16 A. No.
 17 Q. Do you know who arranged it?
 18 A. The counsel.
 19 Q. Okay. And do -- what -- was it -- what
 20 type of operating room was it that you were given
 21 access to?
 22 A. Orthopedic surgery operating room.
 23 Q. Okay. And what time of day was it?
 24 A. We arrived at 9:00 o'clock and we stayed
 25 until late.

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1 Hugger?
 2 A. Correct.
 3 Q. Did you take any temperature measurements?
 4 A. No.
 5 Q. Did you take any velocity measurements?
 6 A. No.
 7 Q. Did you take any -- well, the -- the
 8 Exhibit 4 appears to be a --
 9 A. The dr- --
 10 MS. ANDREWS: Wait.
 11 BY MR. GORDON:
 12 Q. Let me -- let me finish the question.
 13 A. Okay.
 14 Q. It look -- it looks like there's a -- a --
 15 some sort of a ruler or --
 16 A. Right.
 17 Q. -- tape measure depicted in the -- those
 18 photographs; is that right?
 19 A. Correct.
 20 Q. Who is -- can you tell who's holding that?
 21 It looks like -- I'm -- I'm assuming you don't wear
 22 nail polish.
 23 A. Right. So I -- the -- could have been one
 24 or --
 25 MS. ANDREWS: If you know.

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1 Q. In the evening?
 2 A. Afternoon, maybe. I don't recall.
 3 Q. Were -- were there any surgeries being
 4 performed while you were there?
 5 A. No.
 6 Q. Was there any hospital staff present other
 7 than the RN?
 8 A. No.
 9 Q. And I think you said you -- you went to
 10 Santa Monica, the OR, in was it September of 2016?
 11 MS. ANDREWS: Objection. Asked and
 12 answered.
 13 THE WITNESS: I -- it could be, but I am
 14 not sure.
 15 BY MR. GORDON:
 16 Q. Well, in -- in terms of when you developed
 17 the boundary conditions that you provided to
 18 Dr. Apte --
 19 A. Uh-huh.
 20 Q. -- would your visit to Santa Monica have
 21 been before or after you developed those boundary
 22 conditions?
 23 A. Before.
 24 Q. Okay. And when you were in the OR in
 25 Santa Monica, did you turn on the -- the Bair

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1 THE WITNESS: Okay.
 2 MS. ANDREWS: You don't have guess or
 3 speculate.
 4 THE WITNESS: Yeah, I just forgot.
 5 MS. ANDREWS: If you don't know, you tell
 6 him you don't know.
 7 THE WITNESS: Yeah, I don't recall, yeah.
 8 BY MR. GORDON:
 9 Q. Would -- the -- the hand that appears
 10 there, is that the RN, do you know?
 11 MS. ANDREWS: Objection. Asked and
 12 answered.
 13 THE WITNESS: I don't recall.
 14 BY MR. GORDON:
 15 Q. Okay. Were you there when the tape
 16 measure -- measurements were used?
 17 A. Oh, yes.
 18 Q. Okay.
 19 A. Yes.
 20 Q. What -- what was the purpose of -- of
 21 doing the tape measurements?
 22 A. The -- the only thing I can re- --
 23 MS. ANDREWS: Would you --
 24 THE WITNESS: Oh.
 25 MS. ANDREWS: Doctor, I'm really going to

1 have to keep reminding --

2 THE WITNESS: Okay. Okay.

3 MS. ANDREWS: -- you and counsel's going
4 to be just as annoyed with me as I am with you.
5 Please do not start your question until after his --
6 your answer 'til after his question is --

7 THE WITNESS: Okay.

8 MS. ANDREWS: -- absolutely completed.

9 THE WITNESS: Okay.

10 MS. ANDREWS: He -- he's asking them
11 slowly and you're jumping the gun. So just be
12 patient and let him get his entire question out to
13 be fair. Thank you.

14 MR. THORNTON: Keep in mind, this woman
15 down here has to take all the questions and
16 answers --

17 THE WITNESS: I'm sorry, yes.

18 MR. THORNTON: -- and if you're speaking
19 over each other --

20 THE WITNESS: I apologize.

21 MR. THORNTON: -- it can't be done.

22 MR. GORDON: By the time we're done with
23 this, you'll be a pro. Probably not.

24 BY MR. GORDON:

25 Q. Okay. Why -- just -- why were the

1 measurements taken with the tape measure as
2 reflected in Exhibit 4?

3 A. To get the geometry of the drape.

4 Q. Were any other measurements or dimensions
5 taken that day?

6 A. All the drape measurements.

7 Q. So was the main purpose of -- of your
8 visit to the operating room in Santa Monica that day
9 to obtain detailed measurements of the -- of the
10 drapes, or the drape; is that right?

11 A. Not only, yeah.

12 Q. Okay. And that's what -- that's -- that's
13 fine. That -- that's where I want to go next.

14 A. Okay.

15 Q. What other -- what other things did you --
16 did you do while you were in that OR?

17 A. To find out where the air leaving, the hot
18 air of the BH leaving the drape.

19 Q. How did you do that?

20 A. Observing where the air is going from
21 using -- asking the patient sitting there -- the --
22 and touching the air that leaves the drape where all
23 the positions of the drape, yes.

24 [Reporter requests clarification.]

25 THE WITNESS: All the position, yes.

1 BY MR. GORDON:

2 Q. So you -- would -- when you say touch, you
3 used your hand?

4 A. Uh-huh, correct.

5 Q. Okay. You didn't use any instrumentation?

6 A. Correct.

7 Q. Okay. Now, the patient, do you recall how
8 the -- the patient was laying on the table? Was --
9 was -- it looks like a -- is it -- was it a him?
10 It's hard to tell from that.

11 A. Yeah.

12 Q. Were -- were his hands extended?

13 A. Yes.

14 Q. And the Bair Hugger was across the --

15 A. Correct.

16 Q. -- upper torso -- let me finish -- up --
17 upper torso and arms; is that right?

18 A. Correct.

19 Q. And it was face -- the -- the holes of the
20 blanket were facing downward; is that right?

21 A. Correct.

22 Q. Was the blanket -- the Bair Hugger blanket
23 conformed around the patient's arms in any way?

24 MS. ANDREWS: Objection. Vague and
25 ambiguous.

1 THE WITNESS: There were ties and the end
2 of the blanket were tied properly on the arms.

3 BY MR. GORDON:

4 Q. Was the -- and was the blanket -- the
5 blanket is -- is essentially flat, correct?

6 A. Correct.

7 Q. So when it was laying on the arms of the
8 mock patient there, were the -- were the sides that
9 extended beyond the arms folded or curved around the
10 arms?

11 A. Yes.

12 MS. ANDREWS: Objection. Vague and
13 ambiguous.

14 BY MR. GORDON:

15 Q. And they were then cinched down with a --
16 the tie; is that right?

17 A. Correct.

18 Q. And there was a single blanket placed over
19 it, the -- the Bair Hugger blanket? Or single --
20 excuse me. Strike that.

21 There was a single drape placed over the
22 Bair Hugger blanket?

23 MS. ANDREWS: Objection. Vague and
24 ambiguous.

25 If you don't understand the question,

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1 don't answer it.

2 THE WITNESS: The drape was covering as
3 shown here in the picture.

4 BY MR. GORDON:

5 Q. The blue?

6 A. The blue, yeah.

7 Q. Okay. And was there anything other than
8 that single blue drape that was covering the Bair
9 Hugger blanket?

10 MS. ANDREWS: Asked and answered.

11 THE WITNESS: I don't recall.

12 BY MR. GORDON:

13 Q. What was the blue drape made of?

14 A. Plastic.

15 Q. What was its thickness?

16 A. I don't recall.

17 Q. And you were -- when you were doing
18 this -- or participating in this exercise, it was
19 your understanding that the -- that that's -- this
20 was how it's normally done in operating rooms; is --

21 MS. ANDREWS: Objection.

22 MR. GORDON: Let me finish.

23 MS. ANDREWS: Thank you.

24 BY MR. GORDON:

25 Q. A single plastic drape is placed over the

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1 Bair Hugger blanket and nothing else; is that --

2 MS. ANDREWS: Objection. Argumentative.
3 Calls for speculation.

4 BY MR. GORDON:

5 Q. Was that your understanding?

6 A. We asked the RN to set up the patient
7 exactly as in operation.

8 Q. Okay. And so your understanding was that
9 in a regular operation, a single plastic drape is
10 placed over the Bair Hugger?

11 MS. ANDREWS: Objection. Mischaracterizes
12 prior testimony. Calls for speculation. It's been
13 asked and answered.

14 THE WITNESS: I cannot answer the
15 question.

16 BY MR. GORDON:

17 Q. You -- you don't have an -- an
18 understanding as to what your understanding was as
19 to whether that was representative of a typical
20 operation or not?

21 MS. ANDREWS: Objection. Argumentative.
22 Misleading.

23 THE WITNESS: I was told the setup was a
24 normal operation -- operating room setup.

25 BY MR. GORDON:

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1 Q. Okay. Did you do anything independently
2 to -- to see if the information that you were
3 provided about what is a normal setup in an
4 operating room was, in fact, accurate?

5 A. No.

6 Q. Okay. Did you know the RN who did the
7 setup?

8 A. No, never seen her before.

9 Q. You had nothing to do with --

10 A. Okay.

11 Q. -- arranging it?

12 A. Okay.

13 Q. So that was all done by counsel, right?

14 A. I do not know the nurse. I did not know
15 her, if she had before.

16 Q. You could have measured the actual
17 temperature of the air that was exiting from the
18 blanket edge in Santa Monica, couldn't you?

19 MS. ANDREWS: Objection. Calls for
20 speculation.

21 THE WITNESS: Measurements have to be done
22 accurately.

23 MS. ANDREWS: Objection. Move to strike,
24 nonresponsive.

25 Did you laugh, Counsel?

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1 MR. GORDON: Yeah.

2 MS. ANDREWS: You know, I --

3 MR. GORDON: No, I --

4 MS. ANDREWS: -- I take -- I want you to
5 know --

6 MR. GORDON: I'm -- I'm laughing at your
7 moving to strike the answer of your --

8 MS. ANDREWS: I want you to know, Counsel,
9 I take serious offense at people who laugh during
10 federally noticed and subpoenaed depositions of
11 witnesses.

12 MR. GORDON: Yeah.

13 MS. ANDREWS: They're not funny and I
14 would ask you to not do that again.

15 MR. GORDON: Well, Counsel, I take offense
16 at lawyers who com- -- continuously violate the
17 rules that prohibit speaking objections and coaching
18 and trying to control --

19 MS. ANDREWS: But you haven't heard me
20 laugh at you, have you, sir?

21 MR. GORDON: No.

22 MS. ANDREWS: You haven't heard me laugh
23 at your questions, have you, sir?

24 MR. GORDON: No. I --

25 MS. ANDREWS: I will not. So I'm asking

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1 you to -- to give me --

2 MR. GORDON: Your --

3 MS. ANDREWS: -- the same courtesy.

4 MR. GORDON: Your -- your motion to strike

5 your --

6 MS. ANDREWS: And my witness the same
7 courtesy.

8 MR. GORDON: Yeah, your motion to strike
9 your witness's answer to --

10 MS. ANDREWS: Let's take a break.

11 MR. GORDON: -- my question --

12 MS. ANDREWS: We're taking a break.

13 MR. GORDON: -- is not proper.

14 MR. THORNTON: It's been 45 minutes.

15 MR. GORDON: Yeah, that's fine.

16 MS. ANDREWS: Going off the record.

17 THE VIDEOGRAPHER: Off the video record at
18 12:44.

19 (Recess.)

20 THE VIDEOGRAPHER: We are back on the
21 video record. This is DVD No. 2. The time is 1:31.
22 BY MR. GORDON:

23 Q. Dr. Elghobashi, I'm going to hand you back
24 Exhibits 9A, 9B and 9C, the invoices that were
25 previously marked. I -- I looked through there and

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1 didn't see any reference to go -- to the visit to
2 Santa Monica. Is there anything in there that
3 describes that or reflects that? Maybe it was
4 described differently?

5 A. It should be here. I don't know where it
6 is. It should be.

7 Q. As you recall, did you bill for your time
8 in going to Santa Monica?

9 A. Correct.

10 Q. Aga- -- to maybe help contextualize the
11 time, take a look at 9E. That's your proposal --

12 A. Okay.

13 Q. -- that's dated, I think, was that
14 September 14th --

15 A. Correct.

16 Q. -- 2016?

17 Was that proposal prepared before or after
18 your visit to San- -- to the OR in Santa Monica?

19 A. That could be before.

20 Q. And it looks like I don't have the exhibit
21 number, but will the exhibit that would cover that
22 time frame of September --

23 A. Yeah.

24 Q. -- 2016, it looks like the last entry on
25 that is September, I think, 16th?

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1 A. 19.

2 Q. So September 19th?

3 A. Right.

4 Q. And then the next bill that picks up --

5 A. Is May.

6 Q. -- isn't until May, it looks --

7 A. May -- May and March.

8 Q. March of --

9 A. Yeah.

10 Q. -- 2017?

11 A. Yeah.

12 Q. Is it possible that there was an invoice
13 in between September 2016 and May -- March of 2017
14 that isn't reflected here?

15 MS. ANDREWS: Calls for speculation.
16 Asked and answered.

17 You can answer.

18 THE WITNESS: All right.

19 BY MR. GORDON:

20 Q. Well, could I ask you to check your --
21 your files and see if you have any additional
22 invoices beyond the -- the three that are reflected
23 there, and if so, provide them to your -- to counsel
24 to provide to us?

25 A. Agree.

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1 Q. Thank you.

2 When you went to -- so when you went to
3 Santa Monica, you already had drafted Exhibit 9E,
4 the proposal?

5 A. Correct.

6 Q. Okay. Now, in 9E, you say, "The
7 distribution of the blower air along the periphery
8 will be needed as an input together with a
9 temperature of the blower air." It's, like, the
10 third paragraph down.

11 A. No. 5?

12 Q. No. It was in the -- unfortunately, I
13 have only have one copies, but it's --

14 MS. ANDREWS: I have more.

15 BY MR. GORDON:

16 Q. Under operating room description, the
17 second full paragraph, the last sentence.

18 A. Oh, okay. "Distribution of the blower air
19 along the periphery will be needed..." Yes.

20 Q. Okay. What did you mean by that?

21 MS. ANDREWS: Can I just interrupt? I'm
22 sorry. Now that I have my copy, where are you
23 reading, Counsel?

24 THE WITNESS: It's here, "the
25 distribution".

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1 MS. ANDREWS: Thank you.
 2 Okay. Do you have the question in mind?
 3 THE WITNESS: Oh, could you please repeat
 4 the question?
 5 MS. ANDREWS: I apologize.
 6 BY MR. GORDON:
 7 Q. What did you mean by that statement?
 8 A. That means we need this information, as
 9 you read, for the boundary conditions on the drape.
 10 Q. Okay. And by that information, we're
 11 talking about distribution. Let's start -- let's
 12 take it in small pieces. The distribution of the
 13 air. Again, I don't have it in front of me, so I'm
 14 kind of doing -- winging it a little bit here.
 15 A. Sure. Okay.
 16 Q. "The distribution of the air along the
 17 periphery." That --
 18 A. Okay.
 19 Q. That was one. And the other part of that
 20 sentence was "together with the temperature of the
 21 blower air."
 22 MS. ANDREWS: Counsel, I'm going to hand
 23 you a copy since I made numerous.
 24 MR. GORDON: Oh, great. Thank you. Much
 25 easier.

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1 you speak loudly and clearly because --
 2 THE WITNESS: Okay.
 3 MS. ANDREWS: -- our reporter --
 4 THE WITNESS: Sorry.
 5 MS. ANDREWS: -- Madam Reporter needs it,
 6 and we all need to understand exactly --
 7 THE WITNESS: Okay.
 8 MS. ANDREWS: -- the measurements of
 9 technical jargon you're using, or we're all going to
 10 jump on you, Doctor, so --
 11 THE WITNESS: Uh-huh.
 12 MS. ANDREWS: -- thank you.
 13 BY MR. GORDON:
 14 Q. Okay. So when you referred to the
 15 distribution of the blower air along the periphery,
 16 that's what you're looking -- what you're talking
 17 about there is the mass flow rate of the air at the
 18 periphery of the drape?
 19 A. Correct.
 20 Q. Okay. And the temperature of the blower
 21 air, temperature is temperature, right?
 22 A. Correct.
 23 Q. And but you -- where are you saying you
 24 will need the temperature of the blower air? The
 25 blower -- I mean, there's several parts along the

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1 MS. ANDREWS: So you can break it down --
 2 THE WITNESS: Thank you.
 3 MS. ANDREWS: -- in response to the
 4 subpoena that you thanked me for earlier. We can
 5 now ask the questions.
 6 BY MR. GORDON:
 7 Q. So what do you mean -- what -- what does
 8 the phrase "distribution of the blower air along the
 9 periphery," what does that mean?
 10 A. How many kilograms per second leaving the
 11 drape edge.
 12 Q. Kilograms?
 13 A. Yeah.
 14 Q. I'm sorry.
 15 A. Kilograms per second. Mass flow rate.
 16 MS. ANDREWS: Wait a second.
 17 [Reporter requests clarification.]
 18 MR. GORDON: Mass flow rate?
 19 THE WITNESS: Correct.
 20 MS. ANDREWS: Now, can I just -- I'm
 21 sorry, Counsel.
 22 When you're going to use technical
 23 jargon --
 24 THE WITNESS: Okay.
 25 MS. ANDREWS: -- you have to be sure that

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1 way where there's blower air. At what point did you
 2 need the temperature?
 3 MS. ANDREWS: Objection. Compound.
 4 Objection. Vague and ambiguous.
 5 You can answer.
 6 THE WITNESS: Temperature at the drape
 7 edge.
 8 BY MR. GORDON:
 9 Q. Okay. So what you were looking for is two
 10 things at the drape edge, mass flow and temperature,
 11 right?
 12 A. Correct.
 13 Q. Okay. Now, when you went to Santa Monica,
 14 that was after you had 9E, right?
 15 A. Correct.
 16 Q. Okay. And you -- you said you stuck your
 17 hand along the drape edge; is that right?
 18 A. Correct.
 19 Q. You could have used an instrument that
 20 would be capable of measuring mass flow --
 21 MS. ANDREWS: Objection.
 22 BY MR. GORDON:
 23 Q. -- couldn't you?
 24 MS. ANDREWS: Objection. Calls for
 25 speculation. Argumentative.

1 You can answer.
 2 And also mis- -- mischaracterizes prior
 3 testimony.
 4 THE WITNESS: I asked the patient under
 5 the blanket and there was no air leaving anywhere
 6 except on the floor.
 7 MR. GORDON: Okay.
 8 MS. ANDREWS: Move to strike;
 9 nonresponsive.
 10 BY MR. GORDON:
 11 Q. And we -- we'll actually come back to
 12 that, but I -- what I want to -- are you -- are you
 13 aware of any instrument that is cap -- that -- that
 14 is used in engineering to measure mass flow?
 15 A. Yes.
 16 Q. A hot wire and a anemometer, is that
 17 something that you're familiar with?
 18 A. Yes.
 19 Q. You ever used one?
 20 A. Yes.
 21 Q. Would a hat- -- would a -- would -- well,
 22 strike that.
 23 Anything else that -- that -- that you
 24 have used to -- as an instrument that can actually
 25 measure mass flow rates?

1 BY MR. GORDON:
 2 Q. -- to measure the mass flow?
 3 MS. ANDREWS: Same objection.
 4 THE WITNESS: Could you repeat the
 5 question again, please.
 6 BY MR. GORDON:
 7 Q. Is there any reason why, when you went to
 8 the OR in Santa Monica, you couldn't have used a hot
 9 wire anemometer to measure the mass flow at the
 10 drape edge?
 11 MS. ANDREWS: Same objection.
 12 THE WITNESS: You need a lot of
 13 preparation and equipment.
 14 BY MR. GORDON:
 15 Q. What equipment would you need besides the
 16 hot wire anemometer, if any?
 17 MS. ANDREWS: Calls for speculation.
 18 THE WITNESS: You would need computers and
 19 other instruments to connect --
 20 MS. ANDREWS: And other what?
 21 THE WITNESS: Instruments.
 22 MS. ANDREWS: Instruments, sorry. Thank
 23 you.
 24 THE WITNESS: Yes.
 25 BY MR. GORDON:

1 A. You need to measure velocity in 3D.
 2 Q. How do you do that?
 3 A. Laser Doppler anemometer or PIV.
 4 MS. ANDREWS: Could you repeat that,
 5 Doctor? I want to be sure we got it.
 6 THE WITNESS: Laser Doppler anemometer or
 7 PIV.
 8 MS. ANDREWS: Thank you.
 9 BY MR. GORDON:
 10 Q. Is that particle --
 11 A. Image velocimetry.
 12 MS. ANDREWS: Don't -- don't -- he's
 13 not -- wait for his question to be finished and then
 14 you start yours.
 15 BY MR. GORDON:
 16 Q. Particle image velocimetry.
 17 And that's a -- that's a -- a piece of
 18 equipment, or is it a -- it would be a particle
 19 image velocimeter; is that right?
 20 A. (Inaudible response.)
 21 Q. So is there any reason why you could not
 22 have used -- let's start with a hot wire anemometer,
 23 in that OR in Santa Monica --
 24 MS. ANDREWS: Calls for speculation and
 25 argumentative. Mischaracterizes prior testimony --

1 Q. Have you ever seen a hand-held hot wire
 2 anemometer?
 3 A. I have.
 4 Q. Have you ever used one?
 5 A. No.
 6 Q. So other than needing a lot of preparation
 7 and equipment, there's -- there -- there would be no
 8 reason why you couldn't have measured the --
 9 MR. GORDON: You know, Counsel's shaking
 10 her head. I -- I -- I guess she's trying to convey
 11 something to you. Maybe we should have the
 12 videographer put the video on Counsel.
 13 MS. ANDREWS: You know, that would be a
 14 good idea if you have a video on both of us,
 15 Counsel, because of your objections and your
 16 outbursts, including laughing at me. What I'm
 17 trying to do is help you allow the witness to finish
 18 because he's having trouble finishing -- allowing
 19 you to finish your question. So let's -- let's ask
 20 another question --
 21 MR. GORDON: Counsel, you'll --
 22 MS. ANDREWS: -- before you interrupt.
 23 MR. GORDON: You'll -- you'll forgive my
 24 skepticism that your motives --
 25 MS. ANDREWS: I'm not interested --

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1 MR. GORDON: -- are -- are -- are pure.
 2 MS. ANDREWS: -- in your opinions. I am
 3 telling you that we are trying to get a clear
 4 record. I have ordered -- I have -- I have a
 5 gentleman here that's going to give very technical
 6 information. I have ordered realtime so that I can
 7 understand the answers just like you and we're
 8 struggling with the technical difficulties of this
 9 deposition and nothing more.
 10 Now, ask your question, sir.
 11 MR. GORDON: I would ask you, Counsel, not
 12 to give any more nonverbal cues to your witness like
 13 that very obvious shaking of your head.
 14 BY MR. GORDON:
 15 Q. Is there any reason -- and bear in mind,
 16 this is the question that your counsel clearly wants
 17 to you answer no to.
 18 MS. ANDREWS: Objection. Move to strike.
 19 I'm sorry. That is totally inappropriate.
 20 And you will not do that again, sir, or it's going
 21 to take --
 22 MR. GORDON: Well, I --
 23 MS. ANDREWS: Or we're going -- there are
 24 going to be consequences for --
 25 MR. GORDON: You know what? Let's make a

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1 deal.
 2 MS. ANDREWS: -- that type of garbage.
 3 MR. GORDON: Let's make a deal, Counsel.
 4 MS. ANDREWS: No, there's no deal.
 5 MR. GORDON: I won't do that again if you
 6 don't ever --
 7 MS. ANDREWS: There's no deal.
 8 MR. GORDON: -- instruct your witness how
 9 to answer a question by --
 10 MS. ANDREWS: Sir --
 11 MR. GORDON: -- shaking your head.
 12 MS. ANDREWS: And you left the deposition
 13 earlier. Highly inappropriate with the video, and
 14 that has been documented for the Court as well.
 15 This -- this witness is not waiting until
 16 your questions are finished and it's not fair to you
 17 and it's not fair to him. I have ordered realtime
 18 in order to try to help make a clear record. And if
 19 you want to ascribe some -- some other motive to it,
 20 keep it to yourself and keep it professional.
 21 MR. GORDON: I've been in --
 22 MS. ANDREWS: Ask your question, sir.
 23 MR. GORDON: I've been in lots of
 24 depositions, Counsel --
 25 MS. ANDREWS: Ask your question, sir.

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1 MR. GORDON: -- where wit- -- I --
 2 where --
 3 MS. ANDREWS: I'm going to give you one
 4 more chance to ask your question.
 5 MR. GORDON: You're going to give me a
 6 chance?
 7 MS. ANDREWS: That's right.
 8 MR. GORDON: Thanks, Counsel.
 9 MS. ANDREWS: You're welcome.
 10 MR. GORDON: I've been in lots of
 11 depositions where witnesses have not made --
 12 MS. ANDREWS: I'm not interested in where
 13 you have been. I am interested in this witness
 14 giving an answer to a clear question --
 15 MR. GORDON: There's an easy --
 16 MS. ANDREWS: -- in fair and honest way
 17 that he can understand.
 18 MR. GORDON: There's an easy way to signal
 19 to a witness that he needs to pause.
 20 MS. ANDREWS: I am not going to listen to
 21 this.
 22 MR. GORDON: You hold your hand up.
 23 MS. ANDREWS: I am --
 24 MR. GORDON: Your visible shaking of your
 25 head when I'm asking a question --

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1 MS. ANDREWS: Objection.
 2 MR. GORDON: -- is very clearly --
 3 MS. ANDREWS: There is no --
 4 MR. GORDON: -- prompting.
 5 MS. ANDREWS: That is your interpretation
 6 of what I have done. There is no reason for you to
 7 put that in any context other than my trying to get
 8 a clear record. Stop it; ask your question. Or
 9 we'll take our lunch break until you decide to take
 10 a question.
 11 MR. GORDON: If -- if you -- if you shake
 12 your head --
 13 MS. ANDREWS: One more time.
 14 MR. GORDON: -- one more time --
 15 MS. ANDREWS: I'm warning you.
 16 MR. GORDON: -- to -- to signal your
 17 client --
 18 MS. ANDREWS: I'm warning you.
 19 MR. GORDON: -- we are going to end this
 20 deposition --
 21 MS. ANDREWS: I'm warning you.
 22 MR. GORDON: -- we are going to go to the
 23 Court.
 24 MS. ANDREWS: I'm warning you. Ask a
 25 question.

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1 MR. GORDON: Stop warning me.
 2 MS. ANDREWS: Ask a question.
 3 MR. GORDON: You don't get to warn me.
 4 MS. ANDREWS: I can get to -- I can do
 5 whatever I want to keep you in the bounds of the law
 6 to ask proper questions that can be answered.
 7 MR. GORDON: You're -- you're going to go
 8 in front of our Court in Minnesota and say that it's
 9 pop -- perfectly proper --
 10 MS. ANDREWS: Sir --
 11 MR. GORDON: -- when a question's being
 12 asked to go -- be shaking your head as vigorously as
 13 you can so --
 14 MS. ANDREWS: Ask a question.
 15 MR. GORDON: Right.
 16 MS. ANDREWS: You're shaking your head an
 17 awful lot too and you're yelling and that is highly
 18 inappropriate. Ask a question and we'll proceed.
 19 MR. GORDON: That's because your conduct
 20 is beyond --
 21 MS. ANDREWS: Would you like a lunch
 22 break?
 23 MR. GORDON: -- the bounds.
 24 MS. ANDREWS: Would you like a lunch
 25 break, sir, until you can --

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1 Q. -- and instruments?
 2 MS. ANDREWS: Did somebody just ask him
 3 what he said instead of the court reporter? Can --
 4 MR. ASSAAD: No, she didn't.
 5 MS. ANDREWS: Yeah, but I don't --
 6 THE REPORTER: You don't want me repeating
 7 what he said?
 8 MS. ANDREWS: No, I don't. I don't.
 9 THE REPORTER: Okay.
 10 MS. ANDREWS: I want -- I want to read
 11 what you --
 12 THE REPORTER: That's fine.
 13 MS. ANDREWS: -- write and I want to be
 14 able to ask him what he said.
 15 THE REPORTER: Okay.
 16 MS. ANDREWS: But I appreciate your help,
 17 but it's just not appropriate.
 18 THE REPORTER: Okay.
 19 MS. ANDREWS: Thank you.
 20 So you said preparation and instruments;
 21 is that correct?
 22 THE WITNESS: Correct.
 23 MS. ANDREWS: Okay. Thank you.
 24 BY MR. GORDON:
 25 Q. Is there anything other than preparation

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1 MR. GORDON: Nope.
 2 MS. ANDREWS: -- calm down?
 3 BY MR. GORDON:
 4 Q. Back to my question, sir.
 5 MS. ANDREWS: Thank you. Appreciate it.
 6 BY MR. GORDON:
 7 Q. Other than the need for a lot of
 8 preparation and equipment, is there any reason why
 9 you couldn't have used a hot wire anemometer to
 10 actually measure the mass flow rate at the drapery
 11 edges when you went to the operating room in Santa
 12 Monica?
 13 MS. ANDREWS: Objection. Calls for
 14 speculation. Mischaracterizes prior testimony.
 15 THE WITNESS: Preparations and
 16 instruments.
 17 BY MR. GORDON:
 18 Q. And I'm sorry, what?
 19 A. Instruments.
 20 THE REPORTER: Instruments.
 21 BY MR. GORDON:
 22 Q. Right. Is there anything other than
 23 preparation --
 24 MS. ANDREWS: Wait a minute.
 25 BY MR. GORDON:

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1 and instruments that precluded you from taking
 2 actual measurements of a mass flow rate when you
 3 went to Santa Monica?
 4 MS. ANDREWS: Same objection.
 5 THE WITNESS: I've already answered it.
 6 BY MR. GORDON:
 7 Q. Don't -- well, I just want to make -- I'm
 8 sorry. I'm not trying to be argumentative. I'm --
 9 there is noth- -- no other reason that you couldn't
 10 have taken measurements other than lack of equipment
 11 and preparation, right?
 12 MS. ANDREWS: That was his answer, sir.
 13 Objection. Asked and answered.
 14 BY MR. GORDON:
 15 Q. Okay. Is that -- so -- I'm -- I'm -- I'm
 16 sorry. If --
 17 MS. ANDREWS: If there's a question,
 18 just --
 19 MR. GORDON: I'm not --
 20 BY MR. GORDON:
 21 Q. I just want to be clear. If you had had
 22 the instruments and had done the preparation, you
 23 could have actually measured the mass flow rate,
 24 right?
 25 MS. ANDREWS: Objection. Asked and

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1 answered.

2 BY MR. GORDON:

3 Q. Is that right?

4 MS. ANDREWS: Same objection.

5 THE WITNESS: I said preparation and
6 instruments.

7 BY MR. GORDON:

8 Q. I -- I understand what you said. I -- I
9 just want -- I want to be clear. If you had done
10 the preparation, whatever preparation is necessary,
11 and if you had brought the instruments, then you
12 could have measured the mass flow rate, right?

13 MS. ANDREWS: Objection. Asked and
14 answered. Argumentative now. Asked three times.

15 If you have an answer, you need to answer.
16 If you don't have an answer, you can so -- still
17 simply tell counsel you don't have an answer.

18 THE WITNESS: I do not have an answer.

19 BY MR. GORDON:

20 Q. Okay. The other thing in that sentence on
21 9E that you said would be needed as input was the
22 temperature of the blower air, right?

23 A. Correct.

24 Q. And earlier, you -- you -- I -- you
25 explained that that -- by that, you meant the

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1 temperature of the air that was exiting the -- at
2 the periphery of the drape --

3 MS. ANDREWS: Objection. Asked --

4 BY MR. GORDON:

5 Q. -- right?

6 MS. ANDREWS: -- and answered.

7 You can answer.

8 THE WITNESS: The temperature of the air,
9 yes.

10 BY MR. GORDON:

11 Q. As it exits at the drape edge?

12 A. Correct.

13 Q. Okay. And that could have been measured
14 with a thermometer, right?

15 A. No.

16 Q. What -- are there instruments that are
17 capable of measuring temperature?

18 A. There are many other instruments.

19 Q. Okay. What -- what would be the
20 appropriate type of instrument to use to measure the
21 air coming out of the edge of the drape?

22 A. Different anemometers.

23 Q. Could a -- are there hot wire ane- --
24 anem- -- anemometers that could have measured both
25 the air -- the mass flow rate and the temperature?

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1 MS. ANDREWS: Calls for speculation.
2 Compound.

3 THE WITNESS: I answered your question,
4 right?

5 BY MR. GORDON:

6 Q. I -- I don't recall an answer. Are you
7 aware of hot wire anemometers that are available
8 that measure both mass flow rate and temperature?

9 MS. ANDREWS: Compound. Asked and
10 answered.

11 MR. GORDON: Counsel, how is that
12 compound?

13 MS. ANDREWS: You had two objects in
14 there, Counsel.

15 MR. GORDON: Yeah. The question is is
16 there something -- is he aware of something that
17 combines the two objects. That -- that's the
18 essence of the question.

19 MS. ANDREWS: Thank you.

20 MR. GORDON: That's not a compound
21 question.

22 MS. ANDREWS: I think you happen to be
23 correct. I apologize. Thank you for correcting me.

24 BY MR. GORDON:

25 Q. Do you want the question read back?

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1 MS. ANDREWS: Please.

2 THE WITNESS: Please.

3 (Record read as follows:

4 "Q. Are you aware of hot wire
5 anemometers that are available that
6 measure both mass flow rate and
7 temperature?")

8 THE WITNESS: The hot wire anemometers
9 measures velocity, not mass flow rate.

10 BY MR. GORDON:

11 Q. Okay. Is there a way to calculate mass
12 flow rate if you know the velocity and the area?

13 A. Yes.

14 Q. Okay. And the area, you actually took
15 measurements, that -- that allowed you to actually
16 measure the area of the drape edge, correct?

17 A. Correct.

18 Q. And you incorporated those measurements in
19 your CFD, correct?

20 A. Correct.

21 Q. But you have no actual measurements of the
22 velocity of the air exit -- exiting the edge of the
23 blanket, correct?

24 MS. ANDREWS: Objection. Asked and
25 answered. Argumentative. Mischaracterizes prior

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1 testimony.

2 THE WITNESS: If you know the mass flow
3 rate from the blower and you know the drape
4 geometry, you can get the velocity leaving.

5 BY MR. GORDON:

6 Q. So you took the mass flow rate as it exits
7 the Bair Hugger where? At the -- at the nozzle end
8 or out the blanket?

9 MS. ANDREWS: Well, that's compound,
10 Counsel. Objection.

11 THE WITNESS: The mass flow rate is the
12 same.

13 BY MR. GORDON:

14 Q. Okay. And how long does it stay that way?

15 MS. ANDREWS: Objection. Calls for
16 speculation.

17 THE WITNESS: Always.

18 MS. ANDREWS: Improper hypothetical.
19 Sorry.

20 BY MR. GORDON:

21 Q. So once the air exists the Bair Hugger at
22 whatever its mass flow rate, it maintains that mass
23 flow rate forever. Is that your testimony?

24 A. The mass flow rate leaving the blower is
25 the same mass flow rate that leave the blanket

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1 holes, forever.

2 Q. Okay. Once it leaves the blanket holes,
3 you're saying it maintains that same mass flow rate
4 forever?

5 A. The mass flow rate leaving the blanket
6 exit -- that leave the blower exit is identical to
7 the mass flow rate that leave the blanket holes,
8 period.

9 Q. Okay. I -- and I'm taking it to the next
10 step. The mass flow rate of the air leaving the
11 blanket holes, does that stay constant forever?

12 MS. ANDREWS: Objection. Asked and
13 answered.

14 THE WITNESS: As long as the blower
15 running, the mass flow rate will be the same.

16 BY MR. GORDON:

17 Q. So I -- I want to -- I want to make sure I
18 understand, because you're -- you're -- this is your
19 area of expertise, not mine. If we were to set up
20 the Bair Hugger blanket at the -- that far end of
21 the room such that the -- the jets were pointing
22 towards the -- the other end of the room, you're
23 saying that the mass flow rate right outside the
24 blanket would be identical to the -- the far wall?

25 A. I did not say that.

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1 Q. Okay. That's what -- that's my question,
2 so I apologize if I've --

3 A. Okay.

4 Q. -- if I asked it in a confusing way.

5 A. Yeah.

6 Q. At what -- what -- what impacts the mass
7 flow rate after the air has exited the blanket?

8 A. Okay. If the mass flow rate of the
9 blanket is covered by the drape, it would remain as
10 it is until it leaves the drape.

11 Q. If the drape was 100 feet long, it would
12 maintain the same mass flow rate all the way to the
13 -- to that edge; is that right?

14 A. As long as the drape is impermeable, no
15 holes in it.

16 Q. Okay. There are no -- no loss of
17 coherence to the jet?

18 MS. ANDREWS: I didn't get the word.

19 THE REPORTER: Impermeable.

20 MS. ANDREWS: Okay. Impermeable?

21 THE WITNESS: Correct.

22 MS. ANDREWS: Thank you.

23 THE REPORTER: Sorry.

24 MS. ANDREWS: That's not what you typed.
25 It's okay. I just want to be sure we're -- we got

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1 it. Okay.

2 I apologize, Counsel.

3 THE WITNESS: Could you repeat that
4 question?

5 MR. GORDON: Sure.

6 BY MR. GORDON:

7 Q. If the drape is 100 feet long, would it --
8 would -- the mass flow rate would -- may -- would
9 remain constant on all along the edge of the -- the
10 drape?

11 A. If the drape is impermeable, no leaks, the
12 mass flow rate that comes from the blower will
13 always be under the drape until it leaves.

14 Q. And is the velocity of the air the same as
15 it leaves -- as it leaves the blanket, as it leaves
16 the --

17 A. Never.

18 Q. -- edge of the drape?

19 MS. ANDREWS: Hang on. I'm sorry. Wait,
20 wait. Let him ask the question again.

21 Doctor, I'm sorry to keep interrupting.

22 THE WITNESS: Okay.

23 MS. ANDREWS: This is very important
24 technical --

25 THE WITNESS: Okay.

<p style="text-align: right;">Page 110</p> <p>1 MS. ANDREWS: -- testimony. He wants an 2 answer to his question. 3 THE WITNESS: Okay. 4 MS. ANDREWS: And I want you to give a 5 fair -- 6 THE WITNESS: Sure. 7 MS. ANDREWS: Gave him a fair question, 8 you get a -- 9 THE WITNESS: Sure. 10 MS. ANDREWS: -- fair answer. 11 THE WITNESS: Sure. 12 MS. ANDREWS: Can you please repeat it, 13 Counsel? 14 BY MR. GORDON: 15 Q. Okay. The velocity -- first of all, the 16 velocity is one of the components that -- that 17 allows you to calculate mass flow rate, correct? 18 A. We use the mass flow rate to calculate the 19 velocity, not the other way around. 20 Q. Okay. The mass flow rate is the -- 21 A. Of the blower. 22 MS. ANDREWS: Wait. Don't talk when he's 23 talking. Sorry. 24 BY MR. GORDON: 25 Q. The mass flow rate is a -- is a</p>	<p style="text-align: right;">Page 111</p> <p>1 relationship between the amount of the air moving 2 over a particular area over a period of -- 3 particular period of time, right? 4 A. The mass flow rate that comes from the 5 blower would remain fixed until it leaves the drape 6 edge. 7 Q. Will the velocity remain fixed? 8 A. Never. 9 Q. Okay. Will the temperature remain fixed? 10 A. If the drape is insulated, it would remain 11 without a change. 12 Q. For how long? 13 A. The longer, the better. 14 Q. So a insulated drape that was 100 feet 15 long, if you put the Bair Hugger blanket up against 16 the top of it at the 100 feet below, the -- the 17 temperature would remain exactly the same; is that 18 what you're saying? 19 A. No. 20 Q. Would it be more, less, or what would 21 happen to it? 22 A. It depends on the conditions surrounding. 23 Q. And what -- what are the conditions that 24 will impact it? 25 A. The ambient flow, ambient temperature.</p>
<p style="text-align: right;">Page 112</p> <p>1 Q. And how long will the -- strike that. 2 In your 9E, one of the two charac- -- two 3 boundary conditions you said you would -- you would 4 need in that one sentence we read was the 5 temperature of the blower air, which you then 6 explained you meant the temperature as it comes out 7 of the -- the drape edge. 8 You never measured that temperature, did 9 you? 10 MS. ANDREWS: Objection. Argumentative. 11 Asked and answered. 12 THE WITNESS: I did not. 13 BY MR. GORDON: 14 Q. Okay. The only basis for your boundary 15 condition that you provided to Dr. Apte for the 16 temperature of the air emerging at the edge of the 17 drape was what you gleaned from the YouTube video 18 and Exhibit 1D -- 19 MS. ANDREWS: Objection. 20 BY MR. GORDON: 21 Q. -- is that correct? 22 MS. ANDREWS: Sorry. Objection. 23 Mischaracterizes former testimony. Calls for 24 speculation. Lacks foundation. 25 I'm sorry. You can answer, Doctor, if you</p>	<p style="text-align: right;">Page 113</p> <p>1 have the question in mind. 2 THE WITNESS: And a lot of thinking. 3 BY MR. GORDON: 4 Q. Okay. Why didn't you measure the 5 temperature when you went to Santa Monica? 6 MS. ANDREWS: Asked and answered. 7 Objection. 8 THE WITNESS: I answered that earlier. 9 BY MR. GORDON: 10 Q. I apologize. 11 A. Instruments and -- 12 MS. ANDREWS: Same objection. 13 THE WITNESS: -- and preparation. 14 BY MR. GORDON: 15 Q. And -- and I think we were talking -- I 16 may -- I may have missed it, but we were -- spent a 17 fair amount of time talking about the mass flow 18 rate. Now I'm specifically talking about 19 temperature. And if your answers are the same, 20 that's -- that's fine, but I -- I don't think we 21 talked about temperature. 22 A. Instruments and preparation. 23 Q. Okay. What instruments would you have 24 needed to measure the temperature? 25 MS. ANDREWS: Asked and answered.</p>

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1 THE WITNESS: Anemometers, computers,
2 software.
3 BY MR. GORDON:
4 Q. And you thought it was unnecessary to
5 obtain those instruments and do the preparation
6 necessary to actually measure the temperature --
7 MS. ANDREWS: Objection. Argu- --
8 BY MR. GORDON:
9 Q. -- is that right?
10 MS. ANDREWS: Argumentative. Calls for
11 speculation. Lacks foundation.
12 You can answer.
13 THE WITNESS: I never thought unnecessary.
14 BY MR. GORDON:
15 Q. I'm sorry. You never thought it was
16 unnecessary?
17 A. Correct.
18 Q. That's a -- you mean -- so you thought it
19 was necessary?
20 A. Yes.
21 Q. So why didn't you do it?
22 A. I substituted by thinking hard.
23 [Reporter requests clarification.]
24 THE WITNESS: Correct.
25 BY MR. GORDON:

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1 for speculation.
2 THE WITNESS: Never better, but
3 equivalent.
4 BY MR. GORDON:
5 Q. Okay. So what did your thought process
6 entail that you used instead of actual measurements?
7 A. I cannot answer that.
8 Q. I'm sorry, you can -- I'm sorry?
9 A. I cannot answer that.
10 Q. Okay.
11 A. It's a complex system.
12 MS. ANDREWS: Well, wait. Wait. Move to
13 strike. Withdraw as nonresponsive.
14 Just tell -- Counsel, will you -- can we
15 just be -- that question is answerable. I think he
16 didn't understand it, so if you'll allow him to
17 answer what his thinking and thought process is, I
18 won't have to take him on redirect, but -- on
19 direct, but it's up to you. He has an answer.
20 BY MR. GORDON:
21 Q. Do you know what she wants you to say now?
22 A. No.
23 MS. ANDREWS: Objection. Move to strike.
24 BY MR. GORDON:
25 Q. I mean, I -- I just want to -- I want to

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1 Q. Okay. So had you suggested that that --
2 that what you wanted to do was actually take
3 measurements and were told, no, don't?
4 A. No.
5 Q. Okay. So you thought it was necessary to
6 take measurements, but you chose to just think about
7 it instead?
8 A. Correct.
9 MS. ANDREWS: Asked and answered.
10 Argumentative.
11 BY MR. GORDON:
12 Q. What was it that made you decide you were
13 going to go the thinking route rather than the
14 measuring route?
15 A. Experience.
16 Q. And what about your experience told you
17 that thinking was the way to go?
18 Well, let me ask the question a different
19 way. Have you had any experiences in your very long
20 and prominent career in -- in computational fluid
21 dynamics where you found that your thinking about a
22 boundary issue yielded a better result that actually
23 measuring it?
24 MS. ANDREWS: Objection. Unfair --
25 improper hypothetical. Lacks foundation and calls

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1 find out what your -- what your thinking is, so
2 please tell me.
3 MS. ANDREWS: That's right. So do we.
4 THE WITNESS: Experience means one solves
5 different problems at all the time from which I can
6 figure out solutions to something that you cannot
7 measure for the cir- -- circumstances.
8 BY MR. GORDON:
9 Q. When you say you cannot measure, are you
10 talking about inconvenience or serious impediments
11 to -- to measurement?
12 A. Instruments and preparation.
13 Q. Throughout your career, have you ever used
14 your thought process in lieu of instruments like
15 anemometers to measure some important boundary
16 condition?
17 A. It depends on the problem.
18 Q. Can you think of any?
19 A. You can -- I can rely on previous
20 experiences to find out what the temperature in that
21 situation based on other experiences.
22 Q. Well, what previous experiences did you
23 rely on to -- to -- to come up with the temperature
24 boundary condition?
25 A. I think they are in my resume, in my CV,

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1 the projects. There are many projects in the back
2 of -- yeah.

3 Q. Do any of them involve a patient warming
4 device?

5 A. No.

6 Q. Have you ever done any work in connection
7 with a patient warming device?

8 A. Never.

9 Q. You ever done any work in connection with
10 any medical device at all?

11 A. Yes.

12 Q. What medical devices have you done work
13 for -- work on?

14 A. Not a device, but medical problems, yes.

15 Q. Re- -- respiratory problems?

16 A. Right, yes.

17 Q. Okay. In fact, you have six peer-reviewed
18 publications on PUBMED right now, right?

19 A. Do I? I don't know.

20 Q. Okay.

21 A. I never -- I never looked.

22 Q. You've got hundreds of other publications,
23 though, right?

24 A. I really don't -- don't remember. Yeah,
25 that I recall, yeah.

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1 I'm not -- is it Kuehn?

2 THE WITNESS: Kuehn, yeah. It's a German
3 name, yeah.

4 MR. GORDON: Okay.

5 THE WITNESS: So --

6 MS. ANDREWS: Thank you.

7 THE WITNESS: -- which page, please?

8 MR. GORDON: Well, actually, that makes
9 life a lot easier because we have another expert
10 named Keen who definitely pronounces it "Keen."

11 MS. ANDREWS: Right.

12 MR. GORDON: So --

13 MS. ANDREWS: So, Counsel, just --

14 MR. GORDON: -- now that I've been
15 properly --

16 MS. ANDREWS: Admonished.

17 MR. GORDON: -- instructed on --

18 BY MR. GORDON:

19 Q. Do -- do you know Dr. Kuehn?

20 A. No.

21 Q. Okay.

22 MS. ANDREWS: I'm just going to object
23 about this examination and -- and -- on the basis
24 that we just got these reports on June 2nd. I mean,
25 I'll be happy to allow him to answer questions

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1 Q. But other than work that you've done
2 related to respiratory issues, you haven't done any
3 other work in the medical field, right?

4 A. Correct.

5 Q. And to my specific question, you have
6 never done any work that relates to a medical
7 device, right?

8 A. Correct.

9 Q. Did you have an opportunity to review the
10 expert report of Thomas Kuehn, submitted by the
11 defendants in this case?

12 MS. ANDREWS: I think maybe we should show
13 it to him.

14 MR. GORDON: Exhibit -- I'm just -- yeah,
15 I'm going to. Exhibit 13.

16 (Whereupon Exhibit 13 was marked for
17 identification.)

18 MS. ANDREWS: He doesn't pronounce it that
19 way.

20 MR. GORDON: Who doesn't?

21 MS. ANDREWS: That's not the man's name,
22 how it's pronounced, so he might not know who you're
23 talking about.

24 MR. ASSAAD: There's -- there's two Keens.

25 MR. GORDON: Is it pronou- -- I don't --

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1 that -- that he's had a chance to review it, but
2 this wasn't something that we've had the luxury of
3 going over in detail.

4 BY MR. GORDON:

5 Q. Is this the -- and simple question, is the
6 first time you've seen his report, Exhibit 13?

7 A. I mean, I've seen it, but I never read it,
8 really.

9 [Reporter requests clarification.]

10 THE WITNESS: Really.

11 BY MR. GORDON:

12 Q. So are you aware, as you sit here today,
13 that Dr. Kuehn actually did take measurements of
14 both temperature and velocity of --

15 A. I'm not aware.

16 Q. Okay.

17 MS. ANDREWS: Just let him answer -- just
18 be sure he gets his whole question out, in fair --
19 fairness to him.

20 THE WITNESS: Okay.

21 MS. ANDREWS: And we're just going to
22 reassert our -- our right, based on today's ruling,
23 to present rebuttal testimony at trial on these
24 reports. I think that's been made clear, but I just
25 don't want there to be any misunderstanding.

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1 MR. GORDON: I'm going to show you
2 Exhibit 14.
3 (Whereupon Exhibit 14 was marked for
4 identification.)
5 MR. GORDON: This is the copy of an expert
6 report of Dr. Gary Settles. I assume I'm
7 pronouncing that one correctly.
8 MS. ANDREWS: I think so.
9 BY MR. GORDON:
10 Q. Now, have you seen Exhibit 14 before
11 today?
12 A. I have seen it, yes.
13 Q. Did you read it?
14 A. No.
15 Q. Did you read any of it?
16 A. Not really. I -- I've seen the pictures
17 only.
18 Q. Okay. Did you look at the videos that are
19 associated with --
20 A. No.
21 Q. -- the report?
22 A. No, no.
23 MR. ASSAAD: I would like to indicate to
24 counsel that we have yet to receive the videos of --
25 underneath Settles' report, so that's a very

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1 [Reporter requests clarification.]
2 THE WITNESS: Schlieren,
3 S-C-H-L-I-E-R-E-N. That's all.
4 BY MR. GORDON:
5 Q. And just flipping through that, you --
6 A. Yeah, that's all, yeah.
7 Q. Okay. So you have no idea whether the
8 Schlieren images that Dr. Settles took, what they
9 show?
10 A. No. No. Schlieren's visualization, it's
11 not quantitative.
12 Q. Not quantitative?
13 A. Correct.
14 Q. And by quantitative, you mean something
15 that actually measures in a -- in a particular unit
16 of measurement, right?
17 A. Correct.
18 Q. Okay. Are you aware that Dr. Settles took
19 measurements in addition to the Schlieren
20 photography?
21 A. No.
22 Q. I guess not?
23 A. No.
24 Q. So as you sit here today, I take it you
25 have no idea whether Dr. Kuehn's measurements or

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1 misleading question.
2 MR. GORDON: Oh, I honestly didn't know
3 that you hadn't. Is -- was there a technical glitch
4 on that?
5 MR. ASSAAD: They didn't come. They
6 didn't come with the --
7 MR. GORDON: Okay.
8 MS. ZIMMERMAN: It's not in the Dropbox.
9 It's not electronically provided. We didn't get a
10 hard copy of anything with a disk.
11 MR. GORDON: Oh. Well, I'll follow you on
12 that, find out what the problem is.
13 Putting that aside.
14 THE WITNESS: Okay.
15 BY MR. GORDON:
16 Q. So have you -- and do you know
17 Dr. Settles?
18 A. No.
19 Q. You ever heard of him?
20 A. No.
21 Q. Are you aware that Dr. Settles took
22 certain measurements, actual measurements of
23 temperature and airflow from the Bair Hugger?
24 A. I'm not aware. And I just, when I looked
25 at this, I saw Schlieren pictures.

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1 Dr. Settles' measurements either validate or refute
2 the boundary condi- -- any of the boundary
3 conditions that you used in your CFD?
4 A. No.
5 Q. And if they -- if the measurements differ
6 from your boundary conditions by an order of
7 magnitude, would that cause you to question the
8 validity of your CFD?
9 A. Never.
10 MS. ANDREWS: Objection. Vague and
11 ambiguous and improper hypothetical.
12 BY MR. GORDON:
13 Q. Okay. And that's because you --
14 MS. ANDREWS: The answer was?
15 MR. ASSAAD: Never.
16 MS. ANDREWS: Thank you.
17 THE WITNESS: Never.
18 BY MR. GORDON:
19 Q. And that's because you believe your CF- --
20 the CFD based on your boundary conditions based on
21 your thinking is more accurate than measurements
22 actually taken; is that right?
23 A. I repeat what I've said. My CFD is
24 accurate if you have measurements in the same
25 conditions I took, then it will be very accurate.

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1 Q. As I understand it, you provided the
2 boundary conditions to Dr. Apte?

3 A. Correct.

4 Q. And he, using his proprietary software,
5 generated the CFD, right?

6 A. Correct.

7 Q. If those boundary conditions were not
8 reflective of the real world, then the CFD may be
9 accurate based on the boundary conditions that you
10 provided, but it doesn't provide any insight into
11 the real world, right?

12 A. Disagree.

13 Q. So even if the boundary conditions are
14 significantly different than real world conditions,
15 you believe the CFD is -- is an accurate depiction
16 of the real world conditions?

17 A. The CFD produces accurate results for the
18 boundary conditions installed in the code.

19 Q. Right. But if the boundary conditions are
20 incorrect, the CFD is not going to be correct,
21 right?

22 A. If the boundary conditions -- CFD results
23 reflect boundary conditions. That's all. So --

24 Q. The boundary conditions that you --

25 A. Correct.

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1 Q. -- gave Dr. Apte to put in, right?

2 A. Correct.

3 Q. And if the boundary conditions you gave
4 Dr. Apte to put in are inaccurate, then the CFD is
5 also inaccurate, right?

6 A. I do not give inaccurate boundary
7 conditions.

8 Q. Okay. In Exhibit 9E, you list nine steps
9 for which you charged \$120,000, right?

10 A. Yes.

11 MS. ANDREWS: Hold on. What's going on?
12 Hang on a second.

13 THE WITNESS: Yes.

14 MS. ANDREWS: Got it. I have it.

15 MR. GORDON: Keep that for a moment.

16 BY MR. GORDON:

17 Q. Is there anywhere in that list of nine
18 steps where you include validation?

19 A. Validation is needed only if you have a
20 new code you never used before, not validated.

21 Q. So once a code has been validated in one
22 circumstance --

23 A. Yes.

24 Q. -- it's valid for any set of
25 circumstances; is that your testimony?

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1 A. If the code was tested for far more
2 complex situation than the operating room, far more
3 complex, then it will be accurate for a -- for a
4 lower level computations.

5 (Whereupon Exhibit 15 was marked for
6 identification.)

7 BY MR. GORDON:

8 Q. Let me show you Exhibit 15.

9 I'll represent to you that that's a series
10 of screenshots, but from a -- from a much lengthier
11 presentation on "Sudden Expansion - Verification &
12 Validation."

13 You're familiar with this, aren't you?

14 MS. ANDREWS: He asked you if you're
15 familiar with it.

16 THE WITNESS: Oh, you're asking me?

17 BY MR. GORDON:

18 Q. Yes.

19 A. I thought you were talking to yourself.

20 So which page? Or what -- what you want
21 me to look?

22 Q. Well, Exhibit 15. You're -- you wrote it,
23 right?

24 A. Did I write this?

25 Q. You don't recognize it?

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1 MS. ANDREWS: You can take a few minutes
2 to look at it.

3 THE WITNESS: I -- I -- oh, yeah, this
4 is -- oh, it's good. This is the course I teach for
5 undergraduates. Yeah, correct.

6 BY MR. GORDON:

7 Q. Yeah.

8 A. I didn't realize.

9 MS. ANDREWS: I know. Go ahead.

10 BY MR. GORDON:

11 Q. On the first page there it says authors
12 Yong Wang and Said Elghobashi?

13 A. Well, I didn't read that. I'm sorry. I
14 never thought this would be on the web. How did
15 you -- okay. Good.

16 Q. Oh, it's --

17 MS. ANDREWS: Everything's on the
18 internet, right?

19 MR. GORDON: The web is a mysterious
20 place.

21 THE WITNESS: Yeah, this is an
22 undergraduate course, yeah.

23 BY MR. GORDON:

24 Q. Okay. So this is what you use to teach
25 undergraduates?

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1 A. Absolutely.
 2 Q. Okay. And could you read that first
 3 sentence under the -- that you wrote on the -- under
 4 the statement "Verification and Validation"?
 5 A. "It is very important that you take the
 6 time to check the validity of sol- -- right, yes.
 7 Q. Of your solutions?
 8 A. Sure, yeah.
 9 Q. And it -- the -- the words "very
 10 important" are --
 11 A. Yeah. That's --
 12 Q. -- are in bold face, right?
 13 MS. ANDREWS: Wait, wait. You're doing it
 14 again. Let's just --
 15 THE WITNESS: Okay.
 16 MS. ANDREWS: Question, answer.
 17 THE WITNESS: Okay. I'll wait for you.
 18 MS. ANDREWS: If you need time to form --
 19 if you need time to read something --
 20 THE WITNESS: Okay.
 21 MS. ANDREWS: -- or answer something
 22 better, just tell counsel.
 23 THE WITNESS: Okay.
 24 MS. ANDREWS: But don't talk at the same
 25 time.

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1 other context, they don't -- that it isn't very
 2 important that they check the validity of their
 3 solution?
 4 MS. ANDREWS: Argumentative.
 5 You can answer.
 6 THE WITNESS: So I don't know if you are
 7 aware, this is ANSYS, right? ANSYS is the black box
 8 code. So this statement is written because they are
 9 using a black box.
 10 BY MR. GORDON:
 11 Q. What do you mean by a black box?
 12 A. They push buttons on it. They have no
 13 idea what's behind it. Okay? I never use ANSYS for
 14 research.
 15 Q. Do you have access to Dr. Apte's code?
 16 A. I have many codes.
 17 Q. Do you have access to Dr. Apte's --
 18 A. Yes.
 19 Q. -- code?
 20 A. Yes. Yes.
 21 MS. ANDREWS: Wait, wait.
 22 THE WITNESS: Yes. So you're asking about
 23 this, right? ANSYS is not for research. ANSYS is
 24 for teaching undergraduates.
 25 BY MR. GORDON:

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1 THE WITNESS: Okay.
 2 BY MR. GORDON:
 3 Q. You -- so in -- in your teaching of -- of
 4 undergraduates --
 5 A. Sure.
 6 Q. -- in this material you say it is very
 7 important, and you emph- -- and bold faced very
 8 important --
 9 A. Yes.
 10 Q. -- that you take the time to check the
 11 validity --
 12 A. Yes.
 13 Q. -- of your solution.
 14 What are you -- what are you telling your
 15 students when you -- when you say that?
 16 A. What's written here.
 17 Q. Okay. What did you do to validate the
 18 solution in the CFD that was created by Dr. Apte
 19 with your boundary conditions?
 20 A. In the report that I submitted in March,
 21 it has maybe 15 papers to validate that code over 15
 22 years.
 23 Q. So is that -- was that what you tell your
 24 students, that -- that if the code they're using has
 25 already been validated by somebody else in some

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1 Q. Okay. So it's only undergraduates who
 2 have to -- in your view, have to validate their
 3 solutions?
 4 A. No. I didn't say that.
 5 Q. Okay. Help me out then.
 6 A. This is written because they are using a
 7 black box, ANSYS Fluent.
 8 [Reporter requests clarification.]
 9 MR. ASSAAD: Fluent.
 10 THE WITNESS: F-L-U-E-N-T.
 11 BY MR. GORDON:
 12 Q. Let me show you Exhibit 16.
 13 (Whereupon Exhibit 16 was marked for
 14 identification.)
 15 BY MR. GORDON:
 16 Q. This is a paper that you co-authored on
 17 the "Numerical Solution of Laminar Flow Past a
 18 Sphere with Surface Mass Transfer."
 19 A. Right.
 20 [Reporter requests clarification.]
 21 BY MR. GORDON:
 22 Q. This is a paper you co- -- you co-authored
 23 on "Numerical Solution of Laminar Flow Past a Sphere
 24 with Surface Mass Transfer," correct?
 25 A. Yes. Yes.

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1 Q. In the -- the abstract or the summary at
2 the top, the very last sentence is, "These
3 predictions compare well with published experimental
4 observations and other numerical results."

5 Do you see that?

6 A. Correct, yes.

7 Q. What -- what does that mean?

8 A. I think it's any code you use, you have to
9 validate.

10 Q. So the code that you used in this hadn't
11 been validated before?

12 A. This is an undergraduate student who never
13 did -- so he wrote his own code under my
14 supervision. And I'm telling him here, like I told
15 the others, to validate, which we do all the time.

16 I didn't know you have access to this.
17 This is amazing. Okay.

18 Q. So this code that's reflected in
19 Exhibit 16 was validated by the experimental
20 evidence?

21 A. Correct. As -- as written in the paper,
22 yes.

23 Q. So now, for any future application
24 forevermore, it's your view that this code would not
25 need to be validated?

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1 A. This is the laminar flow. I would say for
2 a laminar flow, it will be fine for that student to
3 do it, yes.

4 Q. Without any further validation?

5 A. We always validate codes always. This is
6 undergraduate student wrote his code under my
7 supervision, so I told him to do that. If my own
8 code, which have been developing for 30 years, then
9 I know exactly -- it's already validated for
10 canonical flows and other things, then I know what
11 is like. When you test an airplane, you test it for
12 many years, then you give it to the pilot to take
13 passengers. Codes are like that.

14 Q. Well, in fact, if you've got an airplane
15 design that's been successful for many years and you
16 change some small aspect of the design, there's
17 always some validation that that design change is
18 not going to impact its --

19 A. I'm aware.

20 Q. -- functionality, correct?

21 [Reporter requests clarification.]

22 MR. GORDON: Functionality.

23 THE WITNESS: I'm aware of.

24 BY MR. GORDON:

25 Q. So the fact that an airplane flies under

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1 one set of conditions and under one particular
2 design doesn't mean that modifying that design or
3 modifying the conditions don't need to be checked
4 out, right?

5 A. Correct. If a code was validated for all
6 the ingredients, then it's valid. If you change the
7 condition that the code will run for, you have to
8 revalidate it again.

9 Q. Okay. And --

10 MS. ANDREWS: Counsel, excuse me. The
11 charger. Sorry. Apologize. It's in their lobby,
12 her charger.

13 MS. ZIMMERMAN: Should we take a break?

14 MS. ANDREWS: No, she's okay. I just want
15 -- I just needed to tell somebody to go get it. I
16 apologize.

17 MR. GORDON: Do you want to take your
18 lunch break now? It's 2:30.

19 MS. ANDREWS: No, I think we're doing
20 fine.

21 MR. GORDON: Okay.

22 MS. ANDREWS: We appreciate it.

23 BY MR. GORDON:

24 Q. Let me show you Exhibit 17.

25 (Whereupon Exhibit 17 was marked for

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1 identification.)

2 MS. ANDREWS: Thank you. That's 16, the
3 laminar flow.

4 MR. ASSAAD: We're at 17.

5 MS. ANDREWS: We're at 17 now.

6 MS. ZIMMERMAN: So.

7 MR. ASSAAD: Last one. My mistake.

8 MS. ANDREWS: That's okay. Looking in my
9 stack of papers. Sorry.

10 BY MR. GORDON:

11 Q. This is the Saarinen paper that you cite
12 in your expert report, isn't it?

13 MR. ASSAAD: Sorin? Oh.

14 MS. ANDREWS: Saarinen.

15 Okay.

16 BY MR. GORDON:

17 Q. Is it -- is this the paper that you --

18 A. Uh-huh.

19 Q. -- cite in your --

20 A. Correct.

21 Q. And let's -- let's talk about what you
22 rely on this paper for, or cite it for. Turn to
23 page 6 of your report, expert report, Exhibit 12.

24 A. What page?

25 MS. ANDREWS: Six.

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1 THE WITNESS: Yes.
 2 BY MR. GORDON:
 3 Q. Okay. And the paragraph towards the
 4 bottom, I guess starting at line 123, "LES --
 5 meaning large eddy simulation -- applied to
 6 operating rooms with medical staff and other
 7 instruments is still challenging, owing to the size
 8 of the room and the complexity of the geometries
 9 involved. At the time of the writing of this
 10 report, only one LES study has been performed for an
 11 operating room by Saarinen et al. (2015)."
 12 Did I read that correctly?
 13 A. Yes. Yes.
 14 [Reporter requests clarification.]
 15 THE WITNESS: Correct.
 16 BY MR. GORDON:
 17 Q. And that's Exhibit 16, right, or 17?
 18 A. Yes.
 19 MS. ANDREWS: 17.
 20 MR. GORDON: 17.
 21 THE WITNESS: Okay.
 22 BY MR. GORDON:
 23 Q. And you discuss the -- what the study
 24 does, and conclude that the Saarinen study, "Showed
 25 that LES can accurately predict such flows through

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1 validation with experimental observations."
 2 A. Correct.
 3 Q. Why did you mention anything about the
 4 Saarinen paper?
 5 A. It's here. It's written.
 6 Q. No, I understand, but, I mean, you --
 7 what -- what difference does it make that -- what
 8 the Sarimen -- Saarinen study did or didn't show?
 9 A. I described here what Saarinen did.
 10 What -- what -- what do you want?
 11 Q. Right, but you say it -- it showed that
 12 LES can accurately predict such flows through
 13 validation with experimental observations.
 14 A. Okay.
 15 Q. Your testimony is that LES is validated,
 16 and so you -- you don't -- it doesn't need any
 17 validation in --
 18 A. Sir --
 19 Q. -- other contexts, right?
 20 A. Sir, let me explain to you. Code takes 15
 21 to 20 years to develop. It's your code. You know
 22 everything about it. I cannot take a code from here
 23 (indicating) to say the -- what's quality. We just
 24 are referring that there are only one paper in the
 25 market for LES. That's all. I'm not saying --

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1 I'm...
 2 MS. ANDREWS: Did you finish your...
 3 THE WITNESS: I'm just -- I do not
 4 understand your question. What do you -- what do
 5 you want to read this and say -- I -- I don't
 6 understand. Repeat it again.
 7 BY MR. GORDON:
 8 Q. Well, first of all, the -- the code that
 9 Dr. Apte uses, is that your code?
 10 A. It is not my code, but I have access to
 11 it.
 12 Q. Well, is that one you've helped develop?
 13 A. No.
 14 Q. So when you talk about code that you've
 15 developed over --
 16 A. Right.
 17 Q. -- many, many years, that -- that's --
 18 A. A code.
 19 Q. -- that -- that wasn't the one that was
 20 used?
 21 A. I have other codes, yes.
 22 Q. Okay. Why did you use Dr. Apte's code?
 23 A. My codes are dealing something called DNS,
 24 direct numerical simulation.
 25 [Reporter requests clarification.]

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1 THE WITNESS: Numerical simulation.
 2 BY MR. GORDON:
 3 Q. So you've never developed a large eddy
 4 simulation code; is that correct?
 5 A. DNS code is far more than LES code. It's
 6 different.
 7 Q. Have you ever developed a large eddy
 8 simulation code?
 9 A. DNS code is like an LES code. It's just
 10 you do some modification. It's the same thing.
 11 Q. Why didn't you use DNS for the Bair Hugger
 12 situation?
 13 A. I did not have enough students to run
 14 this, period.
 15 Q. How many students were involved in running
 16 the Bair Hugger one?
 17 A. Four or five.
 18 Q. All in Oregon?
 19 A. Correct.
 20 Q. Getting back to Saarinen, what is it about
 21 Saarinen that you said that -- that it showed that
 22 LES could accurately predict such flows through
 23 validation with experimental observations?
 24 A. As you read this paper, it -- it can
 25 confirm what I wrote here. It's a summary of that

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1 paper.

2 Q. Okay. Well, let's take a look at Exhibit
3 17, the Saarinen paper. First of all, you -- in --
4 in your description of it, you say it -- it was
5 applied to operating rooms, right?

6 A. Yeah, it is. They said that, I think.

7 Q. Okay. Could you show me where they say
8 it, that their study involved an operating room?

9 A. It say that hospital isolation room,
10 single hinged doorway. It's in the title.

11 Q. Is -- is it your understanding that an
12 isolation room is the same thing as an operating
13 room?

14 A. As far as geometry. I don't know the use
15 of it, but geometry, yes. Like how many meters, how
16 many meters, that's all.

17 Q. Well, that would be true of a conference
18 room that was the same --

19 A. No.

20 Q. -- size, right?

21 A. A conference room is not a hospital room.

22 MS. ANDREWS: Wait, wait.

23 BY MR. GORDON:

24 Q. Well, tell me what's -- that's what I'm
25 trying to understand. What's different about the

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1 room that -- the isolation room that Saarinen used
2 and some other room of the exact same dimensions?

3 A. An operating room will have ventilation
4 in, ventilation out and an operating table. That's
5 all I know about an operating room.

6 Q. Is it -- do you know if operating rooms
7 are under positive, negative or --

8 A. I don't know.

9 Q. -- neutral pressure?

10 A. Yes, I do.

11 Q. And what are they?

12 A. Your -- positive or negative allows you
13 to -- diff- -- differential pressure to allow air to
14 leave or air to enter, for example.

15 Q. But -- but are operating rooms -- is it
16 your understanding that operating rooms --

17 MS. ANDREWS: I don't think he was
18 finished.

19 MR. GORDON: Oh, I'm sorry.

20 MS. ANDREWS: I apologize, but did you
21 mean "for example" as the end of your answer?

22 THE WITNESS: No, I'm fine.

23 MS. ANDREWS: Thank you. I apologize.

24 BY MR. GORDON:

25 Q. Are operating rooms, to your

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1 understanding, under positive, negative or neutral
2 pressure?

3 A. If you want a clean room, you want all the
4 air to leave the room. That means you have higher
5 pressure than outside.

6 Q. Is that your understanding of the way
7 operating rooms are configured?

8 A. No, I don't.

9 Q. You don't know one way or the other?

10 A. Correct.

11 Q. Okay. Do you know one way or the other
12 whether the room that was -- the isolation room that
13 was the subject of the Saarinen study was under
14 positive, negative or neutral pressure?

15 A. I do not.

16 Q. Okay. There was no ventilation used in
17 the Saarinen study, correct?

18 A. Perhaps.

19 Q. You want to take a look at it, see if
20 there's any indication --

21 A. I will take me --

22 Q. -- that there was ventilation?

23 A. It will take me time to read it carefully
24 before I make an answer.

25 Q. I'm not sure I want you to do that, then.

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1 A. You want me to read this now?

2 Q. Well, whatever you need to read to find
3 out what the conditions were in the Saarinen that
4 relate to whether it was under -- whether there was
5 any ventilation. And also, the -- the thermal
6 conditions.

7 A. It will take me long time to read it
8 carefully to answer your question.

9 Q. Okay. If you'll look at page 3, the first
10 full paragraph there, maybe that'll speed it up, but
11 by all means, take whatever time you need.

12 A. The first paragraph?

13 Q. Yeah.

14 A. It says isothermal scenario. Isothermal
15 scenario.

16 Q. And it goes on to say without ventilation,
17 doesn't it?

18 A. Right.

19 Q. Okay. What does isothermal scenario mean?

20 A. Temperature is uniform.

21 Q. Okay. Is the temperature uniform in an
22 operating room?

23 A. No.

24 Q. Is there ventil- -- is -- is there
25 ventilation in an operating room?

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1 A. Yes.
 2 Q. In the -- scale. Hang on one sec.
 3 Oh, yeah. In -- in the abstract -- I read
 4 over it three times. In the middle of paragraph,
 5 it's -- they say, "It is shown that the LES method
 6 is able to reproduce at room scale the complex
 7 transient air flows generated during door opening
 8 and closing motions and the passage of a human
 9 figure through the doorway between the two --
 10 between two rooms."
 11 Did I read that correctly?
 12 A. Yeah.
 13 Q. What -- what is your understanding of what
 14 they meant by "at room scale"?
 15 A. Using the dimensions of the room.
 16 MS. ANDREWS: We're trying to find where
 17 you're reading, Counsel. I apologize.
 18 MR. GORDON: Right in the middle of the
 19 abstract.
 20 MS. ANDREWS: Right in the middle. I
 21 apologize.
 22 MR. ASSAAD: Okay.
 23 MS. ANDREWS: There. Thank you.
 24 It is shown...
 25 MR. GORDON: Okay?

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1 your --
 2 A. It was just telling the readers of my
 3 report --
 4 [Reporter requests clarification.]
 5 THE WITNESS: Were just telling the people
 6 reading my report there is only one study mentioning
 7 LES. That's it. If I want to use this for
 8 research, I would do more work to find it junk or
 9 not junk. I don't trust anything.
 10 BY MR. GORDON:
 11 Q. So if you were doing the Bair Hugger thing
 12 for research --
 13 A. Yes.
 14 Q. -- you would have wanted to do more in
 15 terms -- in terms of measurements, validation --
 16 A. No.
 17 Q. -- right?
 18 A. No. The code has been tested for 15 years
 19 for more complex flows, then it will do the Bair
 20 Hugger immediately. It's a lower level. Bair
 21 Hugger is a lower level than what the code was
 22 tested for. Trust me.
 23 Q. So what -- what -- if you -- when you said
 24 about Saarinen, if you were doing this for research,
 25 you would do more. I'm trying to understand --

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1 BY MR. GORDON:
 2 Q. Now, in -- in Saarinen, they -- they
 3 actually did a -- a air flow visualization
 4 experiment in addition to the CFD model, right?
 5 A. Yes.
 6 Q. Well, the -- the CFD that they were using
 7 was already validated, right?
 8 A. I have no idea.
 9 Q. Okay.
 10 A. I don't know whose code.
 11 [Reporter requests clarification.]
 12 THE WITNESS: I don't know whose code. It
 13 could be ANSYS and I don't trust it. Could be.
 14 BY MR. GORDON:
 15 Q. Okay.
 16 A. I have no idea.
 17 Q. And in this particular case, the
 18 calculated migrated air volume differed by
 19 20 percent from the actual experiment, right?
 20 A. Did they measure velocity?
 21 Q. Well, you're -- you're the one who cited
 22 this paper, so I'm trying to understand what -- what
 23 this paper --
 24 A. Okay. It was just --
 25 Q. -- the significance this paper is to

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1 A. Okay.
 2 Q. -- what you're saying.
 3 A. If you want me to refer this and you want
 4 me to ask about the quality or some smoke
 5 experiments, then I have to dig harder and probably
 6 contact those authors to ask about what code they
 7 used, but I didn't. This is only for introduction.
 8 Q. So in your experience, once a code has
 9 been validated, from that point on, it's 100 percent
 10 accurate in predicting everything as long as you put
 11 in boundary conditions that replicate some aspect of
 12 reality?
 13 MS. ANDREWS: Objection. Asked and
 14 answered.
 15 THE WITNESS: If it is my code or code
 16 that I used, then I will do that. Then I know where
 17 it was tested. If you have 15 years, I see all the
 18 paper that tested that code, then I go ahead. I
 19 trust it. Especially -- especially if the tests had
 20 all the physical ingredients that the next problem
 21 will have. Okay? If the physical ingredients are
 22 not the same, then I have to do new validation.
 23 That what we do all our life. You don't trust a
 24 code because it's your code or anything. If it's a
 25 new physics, then you test it again. But if the

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1 physics in the code has all the ingredients and more
2 and more and more, then this is a -- Bair Hugger is
3 a trivial case.

4 BY MR. GORDON:

5 Q. Did you see Professor Abraham's expert
6 report?

7 (Whereupon Exhibit 18 was marked for
8 identification.)

9 BY MR. GORDON:

10 Q. Show you Exhibit 18. It's a expert re- --
11 expert -- expert report of John Abraham.

12 MR. ASSAAD: Not trying to interrupt,
13 Mr. Gordon, but if we're going DOE lunch, I don't
14 know --

15 MS. ANDREWS: It's 3:00.

16 MR. ASSAAD: It's -- if you want to get
17 into this now, that's fine, but it's going to be --

18 MS. ANDREWS: It's a long --

19 MR. ASSAAD: I fear it's going to be a
20 while if he's going to talk about his report.

21 MR. GORDON: Well, I'm guessing it's going
22 to be about as quick as Settles' and Kuehn were, so
23 let me just --

24 MR. ASSAAD: Okay.

25 MR. GORDON: If I'm wrong, then it would

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1 -- then actually --

2 MS. ANDREWS: Can we just break by 3:00?
3 Because some of us are getting a little woozy. Go
4 ahead.

5 MR. GORDON: Yeah.

6 MR. ASSAAD: It's up to you. I mean, I
7 just --

8 MS. ANDREWS: Yeah, you -- just find a
9 good time --

10 MR. ASSAAD: I thought it was a good
11 breaking point, but...

12 MS. ANDREWS: Find a good time at 3:00.

13 BY MR. GORDON:

14 Q. Is this Exhibit 18 something you've seen
15 before?

16 A. I have seen before, yes.

17 Q. Did you read it?

18 A. Not all of it.

19 Q. But you read some of it?

20 A. Some of it.

21 Q. And that -- is it correct that you, in
22 Exhibit 1C, this correction of typographical errors,
23 what -- the errors that you're correcting there are
24 ones that were pointed out in Dr. Abraham's --

25 A. Correct.

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1 Q. -- paper; is that correct?

2 A. Correct. Correct.

3 Q. Okay. And one of the errors that you
4 said -- you indicated was the heat of the lamp that
5 you used.

6 A. Correct.

7 Q. The surgical lamp temperature?

8 A. Yes.

9 [Reporter requests clarification.]

10 MR. GORDON: Surgical lamp temperature.

11 BY MR. GORDON:

12 Q. And that appears in your original report
13 on page 30 -- the table 2 that you're referring to
14 appears on page 33 of your report. Okay?

15 A. Okay. Yeah.

16 Q. Okay. And --

17 MR. ASSAAD: What page are we on?

18 MR. GORDON: 33 --

19 MR. ASSAAD: Okay.

20 MR. GORDON: -- of Exhibit 12.

21 BY MR. GORDON:

22 Q. Now, what -- what you're saying in this
23 correction is that what -- what you really meant to
24 say, instead of 93.92 Celcius, was 93.92 Fahrenheit?

25 A. Of course, yeah.

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1 MS. ANDREWS: Let him finish.

2 BY MR. GORDON:

3 Q. That -- that's the mistake you made,
4 right?

5 A. It's a typo.

6 Q. Okay. Now, for the flow rate, you used
7 meters per second, right?

8 A. Correct.

9 Q. And for the temperature of the inlet
10 grille, you used Celcius, right?

11 A. Correct.

12 Q. On Table 2, page 33.

13 A. Oh, okay. I did not open this. Yes.

14 Q. Okay. And let me just cut to the chase.

15 A. Yeah.

16 Q. Every single one of these entries on Table
17 2 is in --

18 A. Yeah.

19 Q. -- is in a metric unit, right?

20 A. Correct.

21 Q. Except you're saying now that you really
22 intended to have the number be put in for the value
23 of the surgical lamps be in -- in an Imperial unit,
24 Fahrenheit, right?

25 A. Right, yes.

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1 Q. Why?

2 A. It was taken from a table of -- from a

3 paper, and I have to tell you which paper. It has a

4 table of all operating room equipment temperature,

5 and was just put --

6 Q. Is that Memarzadeh?

7 A. No. No. It's -- I don't recall.

8 Q. O'Neill (phonetic)?

9 A. It could be.

10 Q. I'm sorry.

11 A. Yeah, it's -- it got -- so only -- yeah,

12 it's -- you know, 94 Centigrade would be boiling

13 water. Nobody has a lamp like that, right?

14 Q. Did this table -- did you use this table

15 for any of the other values in there?

16 A. What do you mean?

17 Q. Well, I'm -- you said the 93.92 came out

18 of this table --

19 A. Correct.

20 Q. -- but it was in Fahrenheit. Were any of

21 the other numbers that you put in Table 2 from this

22 same table?

23 A. No, no, no, no, no. This -- yeah, all

24 this from this -- the air flow rate for the room,

25 the -- it's all Centigrade. It's all metric units,

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1 A. They're, I think, the same author but

2 different works, and I -- I don't have it with me,

3 but it's in my -- it's -- it has a table of all

4 temperatures of operating room gadgets, something

5 like that.

6 Q. Okay. I -- let's -- I'm just a little bit

7 perplexed.

8 A. Sure.

9 Q. Because if you look at page -- start with

10 page 32.

11 A. I thought I had my -- I left it there, I

12 think.

13 [Reporter requests clarification.]

14 MS. ANDREWS: Hang on a second. Just --

15 we're look -- we're getting a copy of the document.

16 MR. GORDON: Oh, you need his report?

17 MR. ASSAAD: Exhibit what? 32 of Exhibit?

18 MR. GORDON: 12, his report.

19 MR. ASSAAD: Is it up there?

20 MS. ANDREWS: Here.

21 THE WITNESS: Okay.

22 MR. GORDON: No.

23 THE WITNESS: 33.

24 MR. GORDON: Start with 32.

25 THE WITNESS: 32.

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1 right. And, yeah, only the temperature of the

2 surgical lamp was -- yeah, this is the last one,

3 yeah, should -- yeah.

4 Q. Well, I guess we can take a break now.

5 Maybe if you can think of what paper that table --

6 A. Sure, sure, sure.

7 Q. -- came from over lunch, that would be

8 great.

9 MS. ANDREWS: Thank you.

10 MR. GORDON: This concludes DVD No. 2.

11 We're now going off the video record. The time is

12 2:54.

13 (Lunch taken.)

14 THE VIDEOGRAPHER: We are back on the

15 video record. This is DVD No. 3. The time is 3:55.

16 BY MR. GORDON:

17 Q. Just to follow up where we last were, did

18 you figure out what reference it was that you used

19 for the temperatures?

20 A. I think it's McNeill, but I have to check

21 again.

22 Q. And again, I think you cite two different

23 McNeill papers --

24 A. Okay.

25 Q. -- on --

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1 BY MR. GORDON:

2 Q. Well, it goes on to 33, but in the bottom

3 of that paragraph, just above 3.5, you say, "The

4 values are summarized in Table 3.4.2," and it cites

5 McNeill 2012?

6 A. Correct.

7 Q. Now -- but here -- here's one of my

8 questions. I'm -- is Table 3.4.2, is that what is

9 identified as Table 2 on page 33?

10 A. Okay, let me -- let me -- (witness mumbles

11 to self.)

12 342, yeah, it looks -- yeah, correct. Let

13 me just see, yeah. So to say Table 2, so that's

14 another typo. It should have been 3.4.2, yeah,

15 latex. Yeah, it is this.

16 Q. Okay. And so what -- if we look at Table

17 2 on page 33 --

18 A. Yes.

19 Q. -- then the figures for the temperatures

20 of the surgeons and the patients' heads --

21 A. Uh-huh.

22 Q. -- and the surgical lamps are all from

23 that McNeill?

24 A. Correct.

25 Q. But the surgeons -- first of all, the --

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1 the surgeons and the patient, that's given in
2 Celcius, right?

3 A. Right.

4 Q. But McNeill gave the surgical lamps in
5 Fahrenheit?

6 A. I have to look. I mean, I did this --

7 Q. Okay.

8 A. -- a long time ago, yeah.

9 Q. Okay. And where did the -- the
10 temperature of the patient's knee come from?

11 A. Yeah, I have to -- I have to -- I don't
12 recall, but I have to look. I have to let you know
13 later.

14 Q. Okay.

15 A. Yeah.

16 Q. Now, on pages 65 through 70 of your
17 report, it lists references.

18 A. Yes. Yes.

19 Q. Does this comprise the entire list of --
20 of the external sources that you reviewed and relied
21 upon in preparing your report?

22 A. Yes.

23 Q. Okay. How did you go about finding these
24 references?

25 A. I can go one by one to tell you.

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1 Q. Well, let's see if we can break it down
2 into --

3 A. Yeah.

4 Q. -- two different categories. One -- one
5 category is some of the highly technical stuff about
6 CFD.

7 A. Right.

8 Q. Like all the Apte ones, I'm assuming --

9 A. Right.

10 Q. -- either you --

11 A. I kept reading, yeah.

12 Q. You probably just have those by your
13 bedside almost?

14 A. I'm reading. I'm reading the material and
15 they refer to, like, for example, a paper by
16 Memarzadeh and NIH, I go and it references and it
17 keep continuing that. I have to look for all of
18 them.

19 Q. I'm -- I'm more interested in how you
20 found the papers that were more specific to --

21 A. To --

22 Q. -- either the Bair Hugger --

23 A. Okay.

24 Q. -- or to, you know, operating rooms --

25 A. Okay.

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1 Q. -- or infection rates or things like that?

2 A. Okay. Operating room, starting with 3M
3 video.

4 Q. Okay.

5 A. And then the table from 3M that shows the
6 air temperature leaving the blower for different
7 models, which you have today. Okay. So that will
8 be for -- then for the ventilation rooms, we looked
9 at many papers with the door referred in
10 Memarzadeh --

11 [Reporter requests clarification.]

12 THE WITNESS: Many papers that were cited
13 in Memarzadeh's paper about ventilation temperatures
14 and things like that, yeah.

15 BY MR. GORDON:

16 Q. Are they -- and -- and those are -- would
17 be listed here separately, or there would be
18 references in the --

19 A. I'm sure Memarzadeh, his two papers and,
20 yeah, everything is here, yeah.

21 Q. Is that how he pronounces it, by the way?

22 A. I'm not sure.

23 Q. Oh, okay.

24 A. I don't know the person. I have never met
25 him. I just looked at -- let's see here. It's

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1 Memarzadeh, I think. It could be Memarzadeh. I
2 have no idea. I don't know him.

3 Q. Okay. I just --

4 A. Yeah.

5 Q. I don't know how to pronounce it either.

6 A. Yeah, it's a long one.

7 Q. Well, for example, the first reference you
8 have is -- is Albrecht's --

9 A. Yes.

10 Q. -- et cetera. How did you find that?

11 A. Searching. Just searching. Pure
12 searching.

13 Q. Well, what were you -- what were you --
14 where were you searching? Were you using PubMed,
15 med-line, Google Scholar? How were you searching?

16 A. Oh, always Google first, and it will lead
17 me to journals, then I go through that.

18 Q. And what -- and what -- do you remember
19 what your search terms were --

20 A. No, I don't --

21 Q. -- that led you to Albrecht?

22 A. I don't recall.

23 THE REPORTER: Can you please wait until
24 he finishes.

25 THE WITNESS: I don't recall.

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1 Oh, okay. Sorry.
 2 I don't recall, yeah.
 3 BY MR. GORDON:
 4 Q. Okay. Were -- which, if any, of these
 5 references were provided to you by counsel?
 6 A. I don't think any except -- let's see.
 7 Let me go here. Maybe the paper by Noble, it came
 8 from counsel, maybe. Noble. There are many --
 9 Noble is a well-known guy, but I think one of them
 10 came -- yeah, one of them came from counsel, yeah,
 11 but the rest is all -- yeah, correct.
 12 Q. Okay. Okay. And in your CFD, you sel- --
 13 you chose to assume 3 million skin squames.
 14 A. Correct.
 15 Q. And do you remember the distance from the
 16 ground for the floor?
 17 A. One centimeter.
 18 MS. ANDREWS: Pause, please. We have a
 19 technical glitch.
 20 I don't see that our realtime is working.
 21 I'm wondering if one of these other ones are. It
 22 just says lunch.
 23 Can you help us with our realtime?
 24 THE REPORTER: If we go off.
 25 MR. GORDON: Yeah.

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1 THE WITNESS: S-N-Y-D-E-R, Snyder.
 2 BY MR. GORDON:
 3 Q. That's a paper about retail food
 4 operations?
 5 A. Correct.
 6 Q. Okay. And what was it you got from
 7 this --
 8 A. He men- --
 9 Q. -- Snyder paper?
 10 A. He mentioned the number 4 billion squames
 11 and has he detailed -- the title looks funny, but
 12 it's a scientific paper.
 13 Q. Okay. Well, the -- I'm trying -- trying
 14 to understand.
 15 A. So I'm --
 16 Q. Okay. Go ahead.
 17 A. Okay. So 2 meters square by a little
 18 thing, 25-micron by 25-micron, you get 4 billion.
 19 And the paper by Noble said the human being sheds
 20 4 billion squames in one to four days. So I took
 21 one, which is the very conserve -- I took four days,
 22 means 1 billion a day. That's a very conservative
 23 estimate.
 24 [Reporter requests clarification.]
 25 THE WITNESS: Estimate.

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1 MS. ANDREWS: Thank you.
 2 THE VIDEOGRAPHER: Off the video; 4:03.
 3 (Off the record.)
 4 THE VIDEOGRAPHER: Back on the video
 5 record; 6:0- -- or 4:04.
 6 BY MR. GORDON:
 7 Q. Talking about the parameters you used for
 8 the -- the squames in your CFD, how did you decide
 9 on 3 million as the number of skin squames?
 10 A. So human adult, the skin of a human adult
 11 is covered with 4 billion squames. The area of the
 12 human body is 2 meters square, and if you use
 13 squames measurements, photograph shows about
 14 rectangular of a square 25 micron by 25 micron. If
 15 you --
 16 [Reporter requests clarification.]
 17 THE WITNESS: 25 micron by 25 micron. If
 18 you divide 4 billion -- if I divide 2 meters squared
 19 by that area of one squame, you get 4 billion. I
 20 did that, but I found other papers by Snyder showing
 21 the same number.
 22 BY MR. GORDON:
 23 Q. You're talking about --
 24 A. S-N-Y-D-E-R.
 25 [Reporter requests clarification.]

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1 And if you have four medical staff in a
 2 room, they will be emitting 4 billion a day each --
 3 I mean, 1 billion a day each. If you divide that by
 4 24 hours, you get about 40 million squames per
 5 person per hour. Multiplied by four, you get
 6 160 million squames per hour. And I took 3 million,
 7 which is less than 2 percent. I get the very lowest
 8 thing and I put them far away from the patient on
 9 the floor.
 10 BY MR. GORDON:
 11 Q. Well, how did you come up with the 2
 12 percent?
 13 A. It's a small number to divide it over the
 14 area around the table.
 15 Q. Did you consider the impact of protective
 16 clothing that the -- the staff wears?
 17 A. Correct. I read about that, yes.
 18 Q. And did that factor into your
 19 calculations?
 20 A. Correct. I mean, it's -- you read a lot
 21 about this and I came up with 3 million as a very
 22 conservative estimate to be on the floor after one
 23 hour of working in the room.
 24 Q. Did you -- and did you factor in the
 25 impact of the ventilation system on the squames?

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1 A. Okay. Here we go. So first I put the
2 squames all on the floor because in a real room,
3 they are not on the floor. It would have been very
4 easy to put them outside -- above the -- but then I
5 made it so conservative -- I gave 3M the best
6 scenario, from number 2 percent of human beings and
7 all on the floor. I could have put them in the --
8 spread in the room, then we follow how they spread.

9 [Reporter requests clarification.]

10 THE WITNESS: How they spread,
11 S-P-R-E-A-D.

12 BY MR. GORDON:

13 Q. Did you read any studies or any literature
14 that suggested that 3 million squames in the area
15 you defined, one centimeter above the floor, is
16 representative of what actually happens in an actual
17 operating room during a surgery?

18 A. I didn't read a paper that have 3 million.
19 I made an estimate of conserv- -- I could have put
20 10 million or 20 million, which is still a small
21 percentage of the people. I just took the lowest
22 one.

23 Q. But you -- your number, whatever it is,
24 assumed, based on your calculations, that the
25 squames that people were -- were shedding were

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1 settling to the floor and staying there?

2 A. Again, I put them on the floor first and
3 let the fluid mechanics of the room disperse them.
4 I could -- if I had put them spread already, then I
5 will be biasing the result that could be go to the
6 knee directly, if they are above the lamp or
7 something. So I made it so that their position
8 would not be a cause of the result. So I made it so
9 that it would not be causing artificial results. I
10 put them far away from everybody on the floor.

11 Q. Do you have, other than your own
12 calculations, any support for the idea that
13 3 million squames on the floor in the area you've
14 prescribed is realistic --

15 MS. ANDREWS: Objection.

16 BY MR. GORDON:

17 Q. -- based on actual surgeries?

18 MS. ANDREWS: Objection. Argumentative.
19 Form.

20 [Reporter requests clarification.]

21 MS. ANDREWS: Form.

22 THE WITNESS: When papers say a human
23 being sheds 4 billion squames in one day to four
24 days, I took one day. I did not take one day. I
25 took 2 percent of that one day. To me, that is very

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1 real realistic, to me.

2 [Reporter requests clarification.]

3 THE WITNESS: Realistic.

4 BY MR. GORDON:

5 Q. Okay. Did you factor in how -- how many
6 squames the Bair Hugger unit would be removing
7 through its own filtration system?

8 A. Very good question. If I had done this
9 and allowed the filter in the Bair Hugger to allow
10 squames, whatever number, whatever percentage, it
11 will be injected over the body of the patient, and I
12 did not do that. So I prevented all the squames
13 from being sucked by the blower. I could have done
14 that, but I didn't.

15 Q. And the squame size you used was 10
16 microns, right?

17 A. Correct.

18 Q. Do you have any idea what the Bair
19 Hugger's filtration efficiency is for 10 -- particle
20 the size of 10 microns?

21 A. I think it was -- I read about the
22 filtration.

23 MS. ANDREWS: I just don't want you to
24 speculate --

25 THE WITNESS: Okay.

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1 MS. ANDREWS: -- or guess.

2 THE WITNESS: Okay.

3 BY MR. GORDON:

4 Q. Yeah, we -- we started off this morning by
5 saying that, remember?

6 A. Okay.

7 Q. Don't speculate, don't guess.

8 A. Okay. Okay. Okay.

9 Q. Your counsel shouldn't have to --

10 A. Okay.

11 Q. -- you know, tell you that anymore.

12 A. Uh-huh.

13 MS. ANDREWS: But she will if she needs
14 to.

15 BY MR. GORDON:

16 Q. Yeah. But -- but what she's doing is
17 telling you don't answer this question, not --

18 MS. ANDREWS: You know, Counsel, that
19 colloquy --

20 MR. GORDON: Well, Counsel, that was the
21 most obvious prompt.

22 MS. ANDREWS: -- is just absolutely
23 improper.

24 Do you have an -- do you have an answer to
25 the counsel's --

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1 THE WITNESS: No.
 2 MS. ANDREWS: -- appropriate question?
 3 Thank you.
 4 BY MR. GORDON:
 5 Q. So you -- as you sit here today, you have
 6 no idea whatsoever what the Bair Hugger's filtration
 7 efficiency would be for particles 10 microns in
 8 size?
 9 MS. ANDREWS: Objection. Mischaracterizes
 10 testimony.
 11 THE WITNESS: I can answer it clearly. It
 12 doesn't --
 13 [Reporter requests clarification.]
 14 THE WITNESS: I can answer you clearly.
 15 To avoid saying whether the percentage of the filter
 16 allows or does not allow, I prevented all from
 17 passing. No squames passed through the filter.
 18 That's -- that's better than anything.
 19 BY MR. GORDON:
 20 Q. So the Bair Hugger -- you had the Bair
 21 Hugger capturing 100 percent of the squames?
 22 A. Not capturing. We were not allowed to
 23 go -- once it reaches the suction on the floors, on
 24 the bottom of the Bair Hugger, we put them velocity
 25 to zero, the -- the squames will not go anywhere,

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1 THE WITNESS: The Bair Hugger itself, they
 2 were allowed to go specularly, means same angle.
 3 BY MS. ANDREWS:
 4 Q. Sort of like a billiard ball, right?
 5 A. Correct.
 6 MS. ANDREWS: Could you spell specularly
 7 for me?
 8 THE WITNESS: S-P-E-C-U-L-A-R-L-Y.
 9 MS. ANDREWS: Thank you.
 10 THE WITNESS: Yeah.
 11 BY MR. GORDON:
 12 Q. Okay. So in your model, all of the
 13 squames except for those that went to the -- in the
 14 vicinity of the Bair Hugger bounced off anything
 15 they -- they came in contact with?
 16 A. Only 5 percent.
 17 Q. Well, the 5 percent that --
 18 A. The 5 percent.
 19 Q. -- that came in contact with any surface,
 20 they bounced right back and kept -- kept airborne?
 21 A. Correct.
 22 Q. There was one other surface where you had
 23 them --
 24 A. Uh-huh.
 25 Q. -- land, right?

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1 stop. Okay?
 2 Q. So what percentage of those 3 million
 3 squames were -- in your model did you calculate
 4 would reach the Bair Hugger?
 5 A. I -- total number of squames hitting a
 6 surface in the operating room, 5 percent total.
 7 Includes hitting a table, hitting the Bair Hugger
 8 itself, but 5 percent.
 9 Q. And you also, in your -- in your modeling,
 10 made those squames hitting other surfaces perfectly
 11 elastic, correct?
 12 A. Correct. And this is -- this including
 13 the 5 percent.
 14 Q. And just so the jury understands --
 15 A. Yeah.
 16 Q. -- when we're talking about perfect
 17 elasticity, they didn't stick to anything. They --
 18 whatever they hit, they bounce off at exactly the
 19 same energy that they -- that they struck it with?
 20 MS. ANDREWS: Objection. Improper
 21 hypothetical. Compound. Form.
 22 THE WITNESS: Five percent of the
 23 3 million reached a surface and they were -- those
 24 reaching the -- except for the Bair Hugger itself --
 25 [Reporter requests clarification.]

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1 A. Right.
 2 Q. The knee?
 3 A. Yes.
 4 Q. Why did you have them stay there
 5 instead --
 6 A. It stick --
 7 Q. -- of bounce off?
 8 A. -- because we assume that the human was
 9 not a metal surface. Collision depends on many
 10 things. Collision of particle at the surface
 11 required a particle material, surface material, and
 12 many other things. So for the knee, say if the
 13 squame reaches the knee, it will stick there.
 14 Q. But that was the only surface in the
 15 entire operating room --
 16 A. Right, because the other ones --
 17 Q. Let me -- let me finish my question.
 18 A. Oh, sure.
 19 Q. That was the int- -- only surface -- the
 20 surface of the knee --
 21 A. Correct.
 22 Q. -- was the only surface in the operating
 23 room where, in your model, you had the squames
 24 sticking?
 25 A. Correct.

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1 Q. So you -- did you assess all the -- the
2 surfaces in the -- in the operating room to
3 determine if they would have whatever coefficient of
4 friction or whatever it is that --

5 A. No.

6 Q. -- that you're attributing to the knee?

7 A. No.

8 MS. ANDREWS: Misstates prior testimony.
9 Objection. Form.

10 THE WITNESS: No.

11 BY MR. GORDON:

12 Q. Okay. How about the skin surfaces of
13 the -- the operating staff, is there any reason why
14 the squames wouldn't stick to them the way they do
15 to a -- to the knee in your model?

16 A. The clothes and -- we -- they are not the
17 skin of the knee. It's different. The staff are
18 all covered.

19 Q. And do you have any support in any of the
20 literature you've reviewed or cited that -- for the
21 notion that -- that airborne squame behavior in an
22 operating room would be perfectly elastic?

23 A. No.

24 Q. Okay. Have you ever designed a patient
25 warming device?

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1 A. It's not my job. I did not do that.

2 Q. Have you ever been consulted on design of
3 a patient warming device?

4 A. No.

5 Q. Ever published anything on patient warming
6 devices?

7 A. No.

8 Q. Have you done any research in terms of
9 what standard practices are in hospitals in terms of
10 how they use Bair Huggers?

11 A. That's a very general question. What do
12 you mean by that?

13 Q. Well, have you done any research at all in
14 any area of how hospitals use the Bair Hugger?

15 A. No.

16 Q. Okay. Let's turn to page 1 of -- or 2 of
17 your paper. Your -- I mean, your -- excuse me,
18 your -- your report, Exhibit 12. In the first or
19 the second paragraph, the introduction, you say,
20 "Reduction of post-operative surgical site
21 infections has been linked to two main factors."

22 Did I read that correctly?

23 A. Third line? Which line?

24 Q. The first line of the -- of the second
25 paragraph.

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1 A. Oh, second paragraph.

2 MR. ASSAAD: Line 7.

3 THE WITNESS: Oh, second.

4 MR. GORDON: Yeah, I'm sorry. You've made
5 it so much easier with the -- easier and I'm not
6 using it.

7 THE WITNESS: Okay. Okay.

8 MR. GORDON: Line 7, thank you.

9 THE WITNESS: Okay. Reduction of -- yes,
10 go ahead. Yes.

11 BY MR. GORDON:

12 Q. Okay. Are you -- do you consider yourself
13 an expert in --

14 A. No.

15 Q. -- in surgical site --

16 A. No, not at all.

17 THE REPORTER: Please let him finish.

18 BY MR. GORDON:

19 Q. You've got to let me finish the question.

20 A. All right.

21 Q. Do you consider yourself an expert in
22 surgical site infections?

23 A. Never.

24 Q. Okay. What research did you do that
25 allowed you to offer the conclusion that there are

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1 two main factors in reducing postoperative surgical
2 site infections?

3 A. In writing a paper, in a technical paper,
4 you have to have an introduction to say why you're
5 doing this research. That's the purpose of this.
6 Okay? It doesn't say I'm an -- I don't write here
7 I'm an expert. I didn't say that. Where does --
8 where did you see that?

9 Q. So when you say that there are two main
10 factors, that's not based on any research --

11 A. No.

12 Q. -- or -- or analysis?

13 A. Noble, Clark, all these guys.

14 Q. Well, for that statement, you cite to
15 NG -- I don't know how you pronounce it -- Legg and
16 Wood, right?

17 A. Correct.

18 Q. So, I mean, do you -- did you read
19 anything that said antibiotics have nothing do with
20 the reduction of surgical site infections?

21 MS. ANDREWS: Objection. Argumentative.

22 THE WITNESS: No.

23 BY MR. GORDON:

24 Q. Did you read anything that told you you
25 can, you know, disregard aseptic technique --

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1 A. Okay. I am not a medical expert, period.
 2 Q. Okay.
 3 A. So keep your question to this. Thanks.
 4 Q. Well, I --
 5 A. Okay.
 6 Q. I'm trying to understand what it is your
 7 -- you have concluded in your report.
 8 A. Okay. Have you written scientific papers?
 9 Q. I'm not -- I actually -- I am not in a
 10 position to answer your question.
 11 A. Okay. Okay. Good. Thank you.
 12 So writing scientific paper, you introduce
 13 the reader, whoever it is, to why you're writing
 14 this. So it's an introduction. It's a standard
 15 thing. It doesn't say anything about my expertise
 16 in this.
 17 Q. Well, and when you're writing an
 18 introduction, even if it's for a -- an expert report
 19 that you're submitting to a -- to a court, you want
 20 to be accurate, don't you?
 21 A. So this is accurate. This is -- because
 22 if you read these references, they will say these
 23 sentences. That's accurate. It doesn't say I'm an
 24 expert. This would be a lie, and I'm not an expert
 25 in medical hospital things.

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1 45 to say that that "risk can potentially --
 2 [Reporter requests clarification.]
 3 MR. GORDON: "That risk can potentially be
 4 reduced by using HEPA filters."
 5 MS. ANDREWS: Counsel, you didn't read the
 6 first subsection. Are you aware of that? You
 7 didn't read the whole sentence.
 8 BY MR. GORDON:
 9 Q. Were you saying that the HEPA filters had
 10 anything to do with the disruption of ultra-clean
 11 ventilation?
 12 MS. ANDREWS: Objection. Form.
 13 THE WITNESS: I was reading. What's your
 14 question? I was reading this. What did you I -- I.
 15 BY MR. GORDON:
 16 Q. Well, I -- I thought it was clear, but --
 17 A. Oh, no, no.
 18 Q. Maybe I'm wrong. Are you saying that HEPA
 19 filters could potentially reduce disruption of the
 20 ultra-clean ventilation?
 21 A. I'm trying to look at HEPA filter. I
 22 cannot see the word. Maybe I --
 23 MR. ASSAAD: Line 46.
 24 THE WITNESS: 46. The former risk can be
 25 potentially --

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1 Q. So your -- your testimony is if we go and
 2 look at the Ng 2006, Legg 2012 --
 3 A. Yes.
 4 Q. -- Wood 2014, somewhere in --
 5 A. Correct.
 6 Q. -- one or all three of those papers, it
 7 will say the reduction of postoperative surgical
 8 site infections is -- is linked to two main factors:
 9 Ultra-clean ventilation and warming?
 10 A. Correct. Otherwise, I would not have
 11 written it.
 12 Q. Okay. On page 3 at the bottom, you talk
 13 about forced-air warming being something that can
 14 potentially lead to surgical --
 15 MR. ASSAAD: Is there a line number?
 16 MR. GORDON: Thank you. 42 -- starting on
 17 42.
 18 MS. ANDREWS: We're there.
 19 BY MR. GORDON:
 20 Q. Forced-air warming can potentially lead to
 21 surgical site contamination two ways: Direct
 22 contamination and disruption of the ultra-clean
 23 ventilation.
 24 And for -- for -- with respect to the
 25 first one, direct contamination, you go on on line

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1 [Reporter requests clarification.]
 2 MS. ANDREWS: Why don't you just take a
 3 minute and read it.
 4 THE WITNESS: Yeah, okay.
 5 MS. ANDREWS: Because he's directing you
 6 to a part of it that you need to read so you can
 7 answer his question. Take a minute.
 8 THE WITNESS: Okay, I read it.
 9 BY MR. GORDON:
 10 Q. When you're discussing HEPA-rated filters,
 11 what you're talking about as something that you say
 12 could potentially reduce the risk of direct
 13 contamination --
 14 A. Uh-huh.
 15 Q. -- of the air from the blowers?
 16 A. Correct.
 17 MS. ANDREWS: Objection. Form.
 18 BY MR. GORDON:
 19 Q. Okay. What was the basis for you to make
 20 that observation?
 21 MS. ANDREWS: Objection. Form.
 22 THE WITNESS: By reading. By reading
 23 these papers.
 24 BY MR. GORDON:
 25 Q. Can you tell me what papers?

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1 A. No, I cannot.
 2 Q. What's your understanding of what a
 3 HEPA-rated filter does?
 4 A. So micron particles cannot pass through.
 5 Q. What size?
 6 A. Micron. Five micron, I think.
 7 [Reporter requests clarification.]
 8 THE WITNESS: Five microns.
 9 BY MR. GORDON:
 10 Q. Can't pass through at all, is that your
 11 understanding?
 12 A. If it's a filter working, sure, not pass.
 13 Q. So your understanding is that a -- a
 14 HEPA-rated filter would capture 100 percent of
 15 particles --
 16 MS. ANDREWS: Objection.
 17 THE WITNESS: I didn't say that. I was
 18 just saying what's written here, former risk can be
 19 potentially reduced by intake filter that's HEPA
 20 rated, yeah.
 21 BY MR. GORDON:
 22 Q. On page 5, lines 78 through 79, you're
 23 talking -- you -- you cite several different papers
 24 before that and you say that "all information about
 25 the turbulence and velocity fluctuations is

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1 and velocity fluctuations is completely modeled."
 2 A. Correct.
 3 Q. And you italicized modeled.
 4 A. Yes.
 5 Q. What -- what were you -- what was the
 6 meaning -- what were you trying to communicate by
 7 that? What's the significance of the fact that they
 8 were all?
 9 A. Correct.
 10 Q. -- modeled?
 11 A. They are using low order models,
 12 mathematical models to describe turbulence. That's
 13 the meaning. I can explain more if you wish.
 14 Q. Well, what -- what would be the
 15 alternative to them being completely modeled?
 16 A. No. The alternative would be not to model
 17 it. This is modeled. The alternative would be not
 18 modeled, to be computed accurately. Model here
 19 means you take some physical information, you make
 20 an approximation. Modeled here means approximation.
 21 The word modeled here means approximation.
 22 Q. Did you do any research with respect to
 23 hospital practices for cleaning and keeping
 24 operating rooms aseptic?
 25 A. Never, and I don't wish to.

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1 completely modeled," and the word modeled --
 2 A. Uh-huh.
 3 Q. -- is in italics.
 4 A. Correct.
 5 Q. What did -- what did you mean by that?
 6 A. I have to read the previous sentence to
 7 see what I mean. This is called page 44, line 79?
 8 Q. I have page 5, line 79.
 9 A. No, I go -- on the previous page.
 10 Q. Oh, I'm sorry. Okay.
 11 A. On the bottom of the page 79.
 12 MR. ASSAAD: 76, you mean.
 13 THE WITNESS: 76. My eyes are getting
 14 bad, yeah. Okay. There are only -- "There are only
 15 few CFD studies in the literature that use
 16 Reynolds-averaged" --
 17 [Reporter requests clarification.]
 18 THE WITNESS: Reynolds, that's a name,
 19 average, A-V-E-R -- average Navier -- Navier is
 20 N-A-V-I-E-R, Stokes, S-T-O-K-E-S, RANS, yes,
 21 correct.
 22 Question?
 23 BY MR. GORDON:
 24 Q. Well, you're referring to those studies,
 25 you say that "all information about the turbulence

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1 Q. Did you look at any hospital infection
 2 rates?
 3 A. Not my job.
 4 Q. Did you talk to any physicians --
 5 A. No, never.
 6 Q. Let me finish the question.
 7 Did you talk to any of the physicians
 8 who've treated any of the plaintiffs in this case?
 9 A. Never. I didn't know -- I don't know the
 10 plaintiffs. I don't know who.
 11 Q. Did you communicate with any of the
 12 hospitals where any of the plaintiffs were --
 13 A. Never.
 14 Q. -- were treated?
 15 Okay. Did you communicate your findings
 16 to -- about the -- the impact that your model shows
 17 the Bair Hugger would have on an operating -- on an
 18 operation, did you communicate those findings to the
 19 Federal Food and Drug Administration?
 20 A. That's not my job. I'm a research guy,
 21 24/7. I do --
 22 Q. So you --
 23 A. I do -- I do NASA, Navy, highly tech.
 24 This is not.
 25 Q. So you've never --

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1 A. No.
 2 Q. Let me finish.
 3 A. I don't wish to.
 4 Q. Let me finish. Have you ever done any
 5 research that you submitted to the FDA?
 6 A. Never. I don't wish to.
 7 Q. So you haven't submitted anything about
 8 the Bair Hugger to the Centers for Disease Control
 9 either, right?
 10 A. Not my desire. It's -- no.
 11 Q. I'm -- you've never done research in the
 12 medical field --
 13 MS. ANDREWS: Asked and answered --
 14 BY MR. GORDON:
 15 Q. -- other -- other than the respiratory
 16 stuff we talked about earlier?
 17 MS. ANDREWS: Sorry. Objection. Form.
 18 THE WITNESS: Medical field is a big
 19 field. I -- I cannot say I did medical field
 20 research, no.
 21 BY MR. GORDON:
 22 Q. And would it be safe to characterize your
 23 -- the bulk of your research as being related to
 24 things like rocket science?
 25 A. Yes, if you can. Yes, yes.

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1 MR. GORDON: And -- and whether -- whether
 2 it is or it isn't --
 3 MS. ANDREWS: Ask your question.
 4 MR. GORDON: -- you don't get -- you get
 5 to instruct your witness to not answer --
 6 MS. ANDREWS: Ask another question.
 7 MR. GORDON: -- privilege questions.
 8 MS. ANDREWS: You are insulting the
 9 witness. I stand on that and ask another question.
 10 MR. GORDON: Well, actually, I'm not
 11 insulting the witness and you're -- I -- I --
 12 MS. ANDREWS: It's your opinion.
 13 MR. GORDON: -- I don't appreciate your
 14 interpretation of my questions.
 15 MS. ANDREWS: That's fine. But I do, and
 16 I am standing on my objection. Ask another question
 17 and make it a nice one and a proper one.
 18 MR. GORDON: Counsel, in the -- in the
 19 nice contest, trust me --
 20 MS. ANDREWS: Push -- you start making
 21 physical --
 22 MR. GORDON: -- you're not a competitor.
 23 MS. ANDREWS: -- gestures to me, sir --
 24 MR. GORDON: That --
 25 MS. ANDREWS: -- you will be -- you will

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1 [Reporter requests clarification.]
 2 THE WITNESS: Yes, yes. Because he wants
 3 to say it. I said you can, yes.
 4 BY MR. GORDON:
 5 Q. And -- and I -- I -- from what you're
 6 saying, I infer that what you're saying is this --
 7 this kind of stuff that you're modeling, it's not
 8 rock science?
 9 MS. ANDREWS: Objection. Argumentative.
 10 Improper question.
 11 THE WITNESS: I never.
 12 MS. ANDREWS: You don't need to answer
 13 that. It's not a proper question.
 14 THE WITNESS: I never --
 15 MS. ANDREWS: You don't need to answer
 16 that --
 17 MR. GORDON: What's the bas- --
 18 MS. ANDREWS: -- when I tell you not to
 19 answer.
 20 MR. GORDON: What's the basis for your
 21 instructing him not to answer.
 22 MS. ANDREWS: It's an insult. It's an
 23 insult.
 24 MR. GORDON: It's not an insult, Counsel.
 25 MS. ANDREWS: Then ask properly.

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1 be sa- -- you will be --
 2 MR. GORDON: There was no physical gesture
 3 to you. Stop that nonsense.
 4 MS. ANDREWS: You stop it. You're using
 5 your hands --
 6 MR. ASSAAD: I think -- let's take --
 7 we're off the record. Let's take a break. Let's
 8 take a five-minute break. You guys need to cool
 9 down. Let's go, five-minute break.
 10 MS. ANDREWS: Your gestures --
 11 MR. GORDON: Yeah. Take it off.
 12 THE VIDEOGRAPHER: Off the video; 4:32.
 13 (Recess.)
 14 THE VIDEOGRAPHER: Back on the video
 15 record 4:33.
 16 BY MR. GORDON:
 17 Q. Dr. Elghobashi, I -- I'm convinced by
 18 plaintiff's counsel that my last line of questions
 19 were -- didn't come across as I intended them to. I
 20 certainly did not mean any disrespect to you, sir,
 21 and I want to make that very clear.
 22 The point I was trying to make was your
 23 career has been in very high levels, literally
 24 rocket science, and I have the deepest respect for
 25 that. And I was perhaps being a little bit too

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1 clever in trying to say that what -- anything that
2 isn't rocket science -- it's kind of a colloquial
3 joke, you know, well, it ain't rocket science. I
4 wasn't -- didn't mean you any disrespect, sir.

5 A. Okay. The same equations used for rocket
6 science are identical equation used for operating
7 room. Both same complexity, yes.

8 Q. So an operating room CFD would be as
9 complex --

10 A. Correct.

11 Q. -- as rocket science?

12 A. Because the same equations are used. It's
13 called Navier-Stokes equations.

14 [Reporter requests clarification.]

15 THE WITNESS: Navier-Stokes.

16 BY MR. GORDON:

17 Q. Isn't Navier-Stokes an equation
18 essentially used in almost all fluid modeling?

19 A. Correct.

20 Q. So is there any simple system to which
21 Navier-Stokes wouldn't apply?

22 A. Never. Fluid -- all fluid mechanics use
23 Navier-Stokes equations.

24 Q. Okay. So is there something -- well, I'll
25 let that pass.

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1 A. I can -- rocket science, if there's rocket
2 combustion, there would be additional equations that
3 do not -- are not needed in the operating room, but
4 Navier-Stokes would be the same in a rocket and
5 operating room. Any complexity and rocket science
6 would be additional equations: Chemical reaction,
7 compressibility, mach numbers, things like that.

8 [Reporter requests clarification.]

9 THE WITNESS: Mach number, M-A-C-H number.

10 Yeah.

11 BY MR. GORDON:

12 Q. Thank you.

13 If you'd turn to page 10 of your report,
14 Exhibit 12.

15 A. Yes.

16 Q. In the Figure 3, you have a depiction --

17 A. Yes.

18 Q. -- of the BH blower --

19 A. Correct.

20 Q. -- in a box.

21 MS. ANDREWS: 10.

22 BY MR. GORDON:

23 Q. Is -- are those dimensions that are
24 reflected on the drawing, are those intended to be
25 the entire Bair Hugger?

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1 A. Could you repeat again.

2 Q. Well, do you know how tall the Bair Hugger
3 is?

4 A. Yeah.

5 Q. How tall is it?

6 A. I mean, the machine itself is here
7 (indicating), like that height, and then a hose and
8 then a blanket.

9 Q. So -- well --

10 A. Like this is a schematic. This is not
11 real.

12 Q. No, I under- -- -- let me ask the question
13 a different way. The scale that's drawn here would
14 suggest that the height of this object that you've
15 identified as the BH blower is about .7 meters,
16 right?

17 A. Right, that's -- yeah, yeah.

18 Q. A little over, like --

19 [Reporter requests clarification.]

20 BY MR. GORDON:

21 Q. A little over two feet, 2.3 feet?

22 A. Uh-huh.

23 Q. Is that your understanding as to how tall
24 the Bair Hugger is?

25 A. No, the Bair Hugger is lower than that.

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1 Q. Do you know how much lower?

2 A. About 30 centimeters, so 30... foot
3 something, around a foot and few inches.

4 Q. So which part of this drawing is the
5 actual Bair Hugger unit?

6 A. Could be the lower part or something. It
7 says "schematic," so it does not -- yeah.

8 Q. What -- well, who -- first of all, who
9 created that schematic?

10 A. It's from the CAD that was created
11 before -- before the team -- before the simulation,
12 yeah.

13 Q. And who did the inputs to the computer to
14 generate the CAD?

15 A. Okay. We had a CAD from -- we had the CAD
16 from a company in Rochester for -- we added things
17 to the CAD to allow for the Bair Hugger to be in.
18 So we had a CAD before -- for a generic room, and we
19 changed the dimensions to match 3M dimensions.

20 Q. Okay. What I'm just trying to understand
21 is, is this depiction showing the Bair Hugger on the
22 bottom with something else sitting on top of it --

23 A. Right.

24 Q. -- or the Bair Hugger on top sitting on
25 something else?

Page 194

1 A. Right, it's -- the Bair Hugger should be
2 the bottom one, yeah.

3 Q. So what would be -- what's this depicting
4 on top?

5 A. Yeah, I have to look back to see what it
6 is, yeah.

7 Q. Page 28, line 492 -- 491, where you say,
8 "To minimize the effect of boundary conditions, it
9 is necessary to impose a proper, fully developed
10 turbulent form field at the -- it's page 31 --
11 inlet?"

12 A. Yes.

13 Q. Does that refer to, on page 30, Figure 12,
14 the schematic of the inlet that's drawn off to the
15 right?

16 A. Correct. So the duct would be the one on
17 the right, and it should fit on the top of the black
18 rectangle.

19 Q. And by "fully developed," you mean it --
20 essentially it's treated by the computer as if it's
21 going off into infinity?

22 A. No. Fully developed in a pipe or a duct.
23 It's a distance from the inlet -- like the inlet can
24 come from anywhere: A nozzle or anything, and after
25 a while the velocity profile takes a form that

Page 195

1 doesn't change even if you increase the pipe
2 length --

3 [Reporter requests clarification.]

4 THE WITNESS: If you do not increase the
5 pipe length.

6 BY MR. GORDON:

7 Q. Well, in order for the model to be -- to
8 incorporate a fully developed --

9 A. Uh-huh.

10 Q. -- flow at the inlet, doesn't it assume
11 that the duct through which it is coming has no
12 bends in it?

13 A. No, no. It's the -- that part should be
14 straight, and anything beyond that could be bend,
15 could be T-junction or anything; it doesn't matter.

16 Q. What's the height of the duct that need --

17 A. You --

18 Q. Let me finish.

19 A. Okay.

20 Q. -- that needs to be straight before there
21 could be any bends?

22 A. So the length over the hydraulic diameter
23 of the duct would be around 20.

24 Q. 20 times the diameter? I'm sorry?

25 A. Yeah, about 20 times the diameter, yes.

Page 196

1 But this is -- the hydraulic diameter or rectangle.
2 You make a circle of that.

3 Q. Okay. So you -- do you have a -- do you
4 know what the dimensions are of the duct that your
5 model assumed?

6 A. It's identical to the hole in the ceiling.

7 Q. The length of the duct?

8 A. No, no. The cross-section -- the black is
9 the black.

10 Q. Okay. And I -- what I'm asking about is
11 from the duct in the ceiling up into the ventilation
12 system, how -- how long -- how high was that,
13 straight --

14 A. Okay.

15 Q. -- without any bends?

16 A. This is -- this length of a duct
17 (indicating), say let's assume it's 10 time the
18 width of the duct, assume.

19 Q. Okay.

20 A. This is only a mathematical tool -- excuse
21 me -- to get a velocity profile --

22 [Reporter requests clarification.]

23 THE WITNESS: Velocity profile, that is
24 simulate reality. Because if you don't have this,
25 what people do, they put some approximation to what

Page 197

1 goes in here, and that's incorrect. This is the
2 right way to do it.

3 BY MR. GORDON:

4 Q. Do hospital HVAC systems, do they have
5 bends in them that are -- would be --

6 A. Okay.

7 Q. -- shorter than this?

8 A. Okay. This is not an actual hospital duct
9 above the operating room. Otherwise, you will have
10 no ceiling -- I mean, it goes -- right?

11 Q. Otherwise it would have? I'm sorry?

12 A. No ceiling.

13 Q. No ceiling.

14 A. This is a technique of providing a
15 realistic velocity profile at the inlet. If you
16 don't --

17 [Reporter requests clarification.]

18 MR. GORDON: Velocity profile at the
19 inlet.

20 THE WITNESS: At the inlet. I'm sorry.

21 MR. THORNTON: You might want to speak up
22 for the court reporter. I think she is having
23 trouble hearing you.

24 THE WITNESS: I'm sorry, I'm just -- have
25 to look.

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1 Are you waiting for me or --

2 BY MR. ASSAAD:

3 Q. I --

4 A. Okay. So what people do, using commercial
5 codes, they ask them about some intensity and length
6 scale and they put some numbers and get it. This is
7 the right way to do it, trust me. This is -- will
8 give you a velocity profile almost flat that mimics
9 the grille.

10 [Reporter requests clarification.]

11 THE WITNESS: Flat. See the outline here
12 (indicating)? Correct.

13 THE REPORTER: Grill?

14 THE WITNESS: Correct.

15 So if you don't do this, you will get some
16 incorrect profile. This is the right way to do it.
17 00at's how we teach people.

18 BY MR. GORDON:

19 Q. Okay. Go back to page 31; you were just
20 on it --

21 A. Okay.

22 Q. -- if you would.

23 And at line -- well, there is no line
24 number after 504 on this page, but --

25 A. Okay.

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1 Bair Hugger on the floor, there would be no suction.

2 Q. Okay, but it's -- your model assumed that
3 it was right on the floor but for its, what you're
4 describing as the wheels?

5 MS. ANDREWS: Objection. Mischaracterizes
6 the testimony.

7 THE WITNESS: We measure the Bair Hugger.
8 We lift it from the floor in the model as the Bair
9 Hugger has. I don't remember the dimensions. It's
10 not a meter; it's not a half a meter. It's small.

11 BY MR. ASSAAD:

12 Q. Did you do anything to check to see how
13 Bair Huggers are actually used in operating rooms?

14 A. We were in operating room in Santa Monica.
15 We had an actual 750 Bair Hugger.

16 Q. Who set it up?

17 A. The lady, the RN.

18 Q. So you relied on her to be setting it up
19 the standard way; is that right?

20 A. Her job, yes, that's correct.

21 Q. Did you do any independent research to see
22 if there are other ways of setting up the Bair
23 Hugger?

24 A. Never.

25 Q. Did you notice that the Bair Hugger had a

Page 199

1 Q. -- right after that.

2 A. Okay.

3 Q. It says that "the Bair Hugger draws air
4 from the floor of the operating room, heats it and
5 blows it into the blanket.

6 [Reporter requests clarification.]

7 MR. GORDON: Draws air from the floor of
8 the operating room, heats it and blows it into the
9 blanket.

10 BY MR. GORDON:

11 Q. When you say that the Bair Hugger draws
12 air from the floor, what's the area that you are
13 describing there?

14 A. I had -- the Bair Hugger is -- had a
15 little grille in the bottom. I don't remember the
16 dimensions. Could be few inches rectangle,
17 something like that. I looked at it before we did
18 this.

19 Q. And your model assumes the Bair Hugger is
20 sitting on the floor?

21 A. With a height. There is -- the Bair
22 Hugger has wheels, and this -- I don't remember the
23 dimensions, but it would be one inch or two inches,
24 so -- otherwise if it's sitting on the floor, there
25 will be no suction, right? If the filter or the

Page 201

1 clamp on the back?

2 MS. ANDREWS: Objection. Vague and
3 ambiguous.

4 THE WITNESS: I don't remember. I did not
5 check.

6 BY MR. ASSAAD:

7 Q. As you sit here today, are you aware of
8 the Bair Hugger ever being used -- either suspended
9 using that clamp on an IV stand or some other
10 elevated plate?

11 A. I have seen pictures of that, yes, I do.

12 Q. Your model does not treat the Bair Hugger
13 as being elevated in that way --

14 A. Correct.

15 Q. -- is that correct?

16 A. That is correct.

17 Q. Your model assumes that the air is
18 discharged along the edges of the drape uniformly,
19 correct?

20 A. Correct.

21 Q. And would the correct term for describing
22 the way the air emerges be a slot jet?

23 A. Uniformly distributed along the edge. The
24 velocity comes from the blower mount. Mass flow
25 rate divided by --

Page 202

1 [Reporter requests clarification.]
 2 THE WITNESS: Mass flow rate divided by
 3 the area of the edges of the drape.
 4 BY MR. GORDON:
 5 Q. Right. And but it's -- is that -- does
 6 the term "slot jet" have any meaning to you?
 7 A. Yes, of course, yes.
 8 Q. Is what you're describing a slot jet?
 9 A. Okay, but it's -- it's a long -- if you
 10 wish, it's a long slot jet. It's along the edges.
 11 I mean, the slot jet usually, you know, something
 12 like this (indicating). This is distributed
 13 uniformly of a length, yes.
 14 Q. Okay. Have you ever known anyone who has
 15 had surgery with a Bair Hugger?
 16 A. No.
 17 Q. Did you do any research to see what other
 18 pieces of equipment might be used in an operating
 19 room that generate heat?
 20 A. I know there could be other machines, but
 21 I didn't do research on it.
 22 Q. The same question with respect to machines
 23 that could generate air currents, did you do any
 24 research there?
 25 MS. ANDREWS: Incomplete hypothetical.

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1 MS. ANDREWS: Objection.
 2 THE WITNESS: The lamp, the surgical lamp,
 3 has higher temperature than the ambient air that
 4 creates plume air movement, but because it does not
 5 have a blower in it, it's just by buoyancy.
 6 BY MR. ASSAAD:
 7 Q. And thank you. My question is limited to
 8 mechanical movement of air, not thermal convection.
 9 [Reporter requests clarification.]
 10 MR. GORDON: Convection.
 11 THE WITNESS: I did not include the
 12 computer that has a fan or other device that has
 13 fans.
 14 [Reporter requests clarification.]
 15 THE WITNESS: That has a fan. That have a
 16 fan, yeah. Yes.
 17 BY MR. GORDON:
 18 Q. Okay. And in terms of heat sources, the
 19 only ones that you included in your model were
 20 the -- was it two surgeons and --
 21 A. Four...
 22 Q. Four surgeons, two lamps?
 23 A. Two lamps, yes.
 24 Q. And a patient?
 25 A. And the blower.

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1 Form.
 2 THE WITNESS: Question again, please.
 3 BY MR. ASSAAD:
 4 Q. Did you do any research to see if there
 5 were other pieces of equipment used in operating
 6 rooms that generate air currents?
 7 MS. ANDREWS: Air currents?
 8 MR. GORDON: Yes.
 9 MS. ANDREWS: Same objection.
 10 MR. ASSAAD: You can answer.
 11 MS. ANDREWS: I'm sorry, you can answer.
 12 THE WITNESS: Oh, I can answer? I thought
 13 you --
 14 MS. ANDREWS: Forgive me.
 15 THE WITNESS: Okay. The question is --
 16 repeat it. Did I do any research on other devices
 17 in an operating room that blow air? Is that
 18 correct? No, I did not.
 19 BY MR. ASSAAD:
 20 Q. Or generate air currents, I guess is what
 21 I said.
 22 A. No.
 23 Q. Okay. So your model doesn't consider any
 24 other sources of air movement other than the HVAC
 25 system and the Bair Hugger; is that correct?

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1 Q. And the blower.
 2 A. Correct.
 3 Q. Those are the only heat sources?
 4 A. Correct.
 5 MR. GORDON: Thank you.
 6 MS. ZIMMERMAN: Are you done?
 7 MR. GORDON: Uh-huh.
 8 MS. ANDREWS: Sorry, are you finished?
 9 MR. GORDON: Yep.
 10 MS. ANDREWS: Okay. We need a few
 11 minutes.
 12 MS. ZIMMERMAN: We'll be back in just a
 13 few.
 14 MS. ANDREWS: Let me hand you this note.
 15 THE VIDEOGRAPHER: Off the video at 5:04.
 16 (Discussion off the record.)
 17 THE VIDEOGRAPHER: Back on the video
 18 record 5:16.
 19 EXAMINATION
 20 BY MR. ASSAAD:
 21 Q. Dr. Elghobashi, my name is Gabriel Assaad,
 22 and I represent the plaintiffs in this case. And
 23 you and I have met before, correct?
 24 A. Yes.
 25 Q. Okay. And we asked -- and we retained you

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1 to do a computation of fluid dynamics study of the
2 Bair Hugger in operating room?

3 A. Yes.

4 Q. Okay. You were asked questions regarding
5 whether or not you considered other devices in the
6 operating room when you performed your analysis. Do
7 you remember those questions from defense counsel?

8 A. I do.

9 Q. Okay. And you said you didn't consider
10 them, correct?

11 A. Correct.

12 Q. Why didn't you consider them?

13 A. I focused, excuse me, on the devices that
14 will have the main impact on the flow on the
15 operating, on the -- yes.

16 Q. Okay. When you said you want the focus on
17 the device, you're talking about focusing on the
18 Bair Hugger, correct?

19 A. Yes, the Bair Hugger and the -- the whole
20 setup. I took the main ingredients that matters for
21 this flow, like devices that are far away and would
22 have little impact on the results.

23 Q. If any, correct?

24 A. Correct.

25 Q. Okay. And by -- and correct me if I'm

Page 207

1 wrong, but I understand when people do research,
2 they try to -- they don't want to have too many
3 variables so they could determine how one variable
4 acts on the environment. Does that sound correct?

5 MR. GORDON: Object to the form of the
6 question.

7 THE WITNESS: It's too general, but if you
8 want to do research, you have to focus in the main
9 ingredients that matter, yes.

10 BY MR. ASSAAD:

11 Q. Okay. And I'm going to jump around a
12 little bit because we are going to try to get out of
13 here.

14 Earlier today you were talking about the
15 measurements you took at Santa Monica. Do you
16 remember those discussions?

17 A. Correct.

18 Q. And your response was: To do, like,
19 temperature and velocity measurements you needed
20 instruments and preparation?

21 A. Correct.

22 Q. Okay. What did you mean by that?

23 A. I meant it will cost you more than a
24 million dollars.

25 Q. Why?

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1 A. Because PIV need four cameras for 3D and
2 two laser sheets and a lot of equipment for storage
3 and trained personnel; all of them must have many
4 PhDs, yeah.

5 Q. And have you done that in the past?

6 A. I have not.

7 Q. But have you done -- have you read
8 research and people doing that in the past?

9 A. Yeah, I know who -- who are the best in
10 the country.

11 Q. Okay. And you're familiar with the cost
12 of how much that will cost?

13 A. Definitely.

14 Q. Okay. And when you do take measurements,
15 does it make a difference if a person is tak- --
16 doing it by hand as compared to it being done by
17 computers and PIV?

18 A. These days, yes.

19 Q. Why?

20 A. For accuracy you need 3D measurements --
21 [Reporter requests clarification.]

22 BY MR. ASSAAD:

23 Q. Just repeat your answer. For accuracy?

24 A. For accuracy, accuracy, yes; for accurate
25 measurements you need qualified people to do the

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1 measurements, and I'm not talking about flow
2 visualization, like sheering and all this. I want
3 people to measure three dimensional velocity
4 components, U, V and W, the function of time and
5 space, and then you can do proper comparison.

6 Q. People in your field, do they use a hot
7 wire anemometer to take temperature and velocity
8 measurements to validate a CFD study?

9 A. Not these days.

10 Q. Why not?

11 A. Because they're not accurate.

12 Q. Okay. And the fact that someone is in the
13 room taking that measurements, does that change the
14 results of those measurements?

15 A. Invasive, you don't not need invasive --
16 [Reporter requests clarification.]

17 MR. ASSAAD: Invasive.

18 THE WITNESS: Invasive.

19 [Reporter requests clarification.]

20 THE WITNESS: You -- it should be
21 noninvasive technologies, yes.

22 BY MR. ASSAAD:

23 Q. Okay. And when you give a noninvasive,
24 where no one else is in the room, correct?

25 A. Right.

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1 Q. Why?

2 A. Because disturbances by moving objects

3 will give you different results any time. So you

4 want to make it pure measurements, you have to have

5 PIV, for example, yes.

6 Q. Would you consider a measurement to

7 validate a CFD model or study by a hot wire

8 anemometer reliable?

9 A. No.

10 Q. And let's talk about the code. Explain

11 the code that you used from Stanford. Well, let me

12 withdraw that. That's very broad.

13 Who created the code?

14 A. 15 PhDs at Stanford.

15 Q. And has the code been evolving?

16 A. Definitely.

17 Q. Okay.

18 A. Tested -- validated every year through

19 that, yes.

20 Q. And when you say you were validated every

21 year, is -- has it been validated with more complex

22 models than what was done here in this case?

23 A. Validated?

24 MR. GORDON: Object to the form of the

25 question.

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1 A. The PhD students who developed it over the

2 years, they have access; post docs and I have access

3 now because I work with them.

4 Q. And is the code accurate?

5 A. Yes.

6 Q. Is it reliable?

7 A. Yes.

8 Q. Is it valid?

9 A. Validated, yes.

10 Q. And when you say "complex," can you give

11 me real life examples where this code has been

12 validated?

13 A. So if you have a combustion chamber in a

14 jet engine, like, say, for -- that's used for 737 or

15 767, it has a spray nozzle that sprays liquid

16 droplets. They evaporate -- evaporate. They mix,

17 they burn. And Pratt & Whitney measures

18 temperature, velocity accurately. And you compare

19 with them, and the paper -- published paper show

20 accurate comparison.

21 Q. Okay. And let's -- and we've mentioned

22 the word -- the code like ANSYS. Are you familiar

23 with ANSYS?

24 A. Yeah, I use it for undergraduate teaching.

25 Q. Okay. You don't use it for your graduate

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1 THE WITNESS: Validated with more complex

2 flows? It's validated with simple to far complex.

3 Starts from a channel flow called isothermal flows.

4 [Reporter requests clarification.]

5 MS. ANDREWS: Channel flow. Isothermal

6 flow.

7 THE WITNESS: Then swirling flows, which

8 is very complex. No RANS code can do it.

9 [Reporter requests clarification.]

10 THE WITNESS: RANS, R-A-N-S. That's an

11 abbreviation.

12 And then went into particle-laden flows,

13 droplet-laden flows, chemical area acting, swirling

14 droplet flows. These are used for Pratt & Whitney

15 for jet engines. So 15 years of development, every

16 step of the way you validate it with experiments

17 from Pratt & Whitney, from Germany, from Cambridge,

18 all the way. Then after we have a code like this,

19 you know what you're getting.

20 BY MR. ASSAAD:

21 Q. And you know that when you -- the -- the

22 model or the fluid flow that the code generates is

23 accurate and valid?

24 A. Absolutely.

25 Q. Okay. And who has access to this code?

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1 students?

2 A. Never.

3 Q. Why not?

4 A. When you teach graduate students to do

5 research, they have to know every line in the code,

6 so they know what boundary conditions, what mesh,

7 what they validate. ANSYS does not give you that

8 chance. We teach --

9 [Reporter requests clarification.]

10 THE WITNESS: Does not give you that

11 chance. We teach it for undergraduate only. I

12 created the course for them to get a job in industry

13 because industry -- all the industry in the US and

14 abroad, they use ANSYS, and therefore, I wanted them

15 to be ready to use it, but they do not know what's

16 behind. Just buttons, click, click, click. So that

17 we don't -- for graduate we cannot do that.

18 BY MR. ASSAAD:

19 Q. With respect to -- and what you did in

20 your report, did you model air flow or did you model

21 particle movement?

22 MR. GORDON: Object to the form of the

23 question.

24 THE WITNESS: We -- we simulate. We solve

25 equations for the fluid flow, turb- --

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1 [Reporter requests clarification.]

2 THE WITNESS: Equations -- E-Q-A -- for
3 the fluid flow, and after that we solve the
4 individual -- the equation for individual squame,
5 one by one for 3 million, to follow where they go
6 accurately.

7 BY MR. GORDON:

8 Q. And when you follow the -- when you follow
9 the particles, did you use the -- the Euler method
10 or the Lagrange?

11 A. Lagrange method.

12 Q. Do you know whether or not ANSYS uses
13 Lagrange or Euler?

14 A. I do not know.

15 Q. Based on your experience in the use of
16 ANSYS and teaching it to your students, can ANSYS
17 give you an accurate solution to the problem of what
18 you did with respect to the Bair Hugger in the
19 operating room?

20 A. Not in a million years.

21 Q. Can you explain why?

22 A. In one of the projects for the
23 undergraduate students, we teach them how to predict
24 turbulent pipe flow. This is homework number two.
25 And so turbulent pipe flow is a very well known

Page 215

1 flow. It's been measured by many people. The most
2 important experiment was done from Professor Laufer
3 at CalTech.

4 Laufer L-A-U-F-E-R, in the 1950s. The
5 best supported by NASA. And Fluent cannot predict
6 the experiment of a simple turbulent pipe flow.
7 Error is quite large errors.

8 Q. And that's based on your current
9 understanding of Fluent and what you teach in class,
10 correct?

11 A. Correct.

12 Q. Okay. So based on what you know about
13 Fluent, would Fluent be reli- -- ANSYS Fluent or
14 ANSYS CFX be reliable in solving particle movement
15 in operating rooms such as you did?

16 A. Never.

17 Q. Is it accurate?

18 A. No.

19 Q. Would people in your field that do what
20 you do use a software such as ANSYS Fluent or ANSYS
21 CFX to solve particle flow in any situation?

22 MR. GORDON: Object to the form of the
23 question. Also lack of foundation.

24 THE WITNESS: The people I'm aware of who
25 are top researchers in the world do not use ANSYS.

Page 216

1 BY MR. GORDON:

2 Q. Because you mentioned -- you said ANSYS is
3 a black box, correct?

4 A. Because of that, yes.

5 Q. When you say "black box," what do you
6 mean?

7 A. You do not know when you select a model
8 from the choice menu -- ANSYS has menus. Menu.

9 [Reporter requests clarification.]

10 MS. ANDREWS: ANSYS has a menu.

11 THE WITNESS: ANSYS. And if you select a
12 menu for a certain model of a certain physical
13 phenomena, you do not know how this is executed.

14 BY MR. GORDON:

15 Q. Okay. Would you allow any of your
16 graduate students or PhD students to use ANSYS or
17 Fluent?

18 A. Never.

19 Q. All right. With respect to -- okay. I
20 want to talk about the methodology with respect to
21 your conclusions. Okay. My understanding is that
22 you create a geometry, correct?

23 A. Correct.

24 Q. How do you create the geometry?

25 A. We use CAD and we set --

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1 [Reporter requests clarification.]

2 THE WITNESS: CAD.

3 THE REPORTER: I heard that.

4 [Reporter requests clarification.]

5 THE WITNESS: We do the setup.

6 BY MR. ASSAAD:

7 Q. And that's a 3D geometry, correct?

8 A. Correct.

9 Q. And then what's next? What do you do
10 after you do the CAD geometry?

11 A. We create a mesh.

12 Q. What is a mesh?

13 A. You -- you divide the volume of the room
14 into small volumes in which you solve the equation
15 locally in time and space, 3D.

16 Q. Okay. And is the setup of the mesh
17 crucial in the solution of the problem?

18 A. Essential.

19 Q. Essential, okay.

20 And you created a chart in your -- with
21 respect to your mesh -- first of all, you showed the
22 mesh in you diagram on page 27, correct?

23 A. Correct.

24 Q. And explain the mesh. Are they just
25 little squares? Are they circles? What are they?

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1 A. They're a combination of hexagon,
2 tetrahedrons and pyramid -- pentagon -- yeah.
3 [Reporter requests clarification.]

4 THE WITNESS: Pentahedral -- okay.
5 Hexagon, pentahedral, tetrahedral, yes.
6 BY MR. ASSAAD:

7 Q. Okay. And why are they different -- why
8 are there different --

9 A. Because --

10 Q. -- shapes?

11 A. Because in a complex geometry and you want
12 to know the flows near the head of the patient, you
13 want to -- the mesh to form according to the shape
14 your -- to the geometry you're having, yeah.

15 Q. Okay. And in creating the mesh, do you
16 put a more finer mesh in certain areas --

17 A. Absolutely, yes.

18 Q. -- as compared to other --

19 A. Yes.

20 Q. Why would you do that?

21 A. To capture details of the flow and
22 temperature in critical zones.

23 Q. So if I understand you correctly, the more
24 critical zone, or where you want to find what's
25 really going on, you make a finer mesh?

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1 A. Correct.

2 Q. Okay. And then can you explain -- did you
3 do that in this case --

4 A. Absolutely.

5 Q. -- in this model or this --

6 A. It's an essential -- it's like this --
7 essential.

8 Q. Okay. Let's go to page 29. And there's
9 something called mesh skewness and mesh aspect
10 ratio.

11 A. Correct.

12 Q. What is that -- what is the meaning of
13 that for someone that's a layman like myself and
14 everyone else here in this room?

15 A. Okay. I know. It's -- in order to solve
16 the three-dimensional Navier-Stokes equations and
17 energy equations, you have some rules; in that
18 subject, you have some rules. For example, if you
19 have a mesh that looks like a spaghetti for one
20 cell, that will remove certain terms from the
21 equation by error. So you should not have -- so we
22 aspect ratio, how long compared to the width or --
23 so you have always to check the aspect ratio, each
24 cell, to make sure you're not violating the rules of
25 the subject flow -- of the simulation.

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1 Q. And just, by the way, the methodology that
2 you used in solving this problem, is this the same
3 methodology you've used in other problems?

4 A. Yes, it's a standard methodology.

5 Q. And do you know whether or not it's the
6 same methodology used by other people in your field
7 that do what you do?

8 A. I cannot judge for other people. The good
9 people do that.

10 Q. Okay.

11 A. The top people.

12 Q. The people that you work with at NASA and
13 the Navy and with the NIH, are they the type of
14 people that would use the same methodology as this?

15 A. Right. I'm talking about people in
16 academia do that work. I don't know about
17 government agencies. But usually the government
18 agency ask university to do the important work, and
19 the people who do the important work for government
20 follow that procedure.

21 Q. I want to jump back, and there was a time
22 when you were asked questions about the boundary
23 conditions.

24 A. Yes.

25 Q. Okay. And you kind of -- you kind of

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1 mentioned that it's what you did, like you just
2 thought about it a lot?

3 A. Correct, yes.

4 Q. Okay. You didn't just come up with
5 something out of the blue, correct?

6 A. No.

7 MR. GORDON: Object to the form of the
8 question.

9 BY MR. ASSAAD:

10 Q. Okay. It's not something that you just
11 pulled from thin air, correct?

12 A. No.

13 Q. Can you explain what you meant by when you
14 thought a lot about the boundary conditions, what
15 type of mental and mathematical process you went
16 through in your mind?

17 A. You have to apply certain equations of
18 motion of air over a flat plate and --

19 Q. What type of equations?

20 A. Still Navier-Stokes. Navier-Stokes are
21 the equations used everywhere.

22 Q. Okay.

23 A. And that will allow you to judge whether
24 the temperature of the edge of the drape is, say,
25 41 degrees if you have start from 42 or something,

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1 yeah.

2 Q. So are these actual calculations you just
3 jotted down or calculated?

4 A. Sometime -- sometime before we do the
5 boundary condition, yes.

6 Q. Okay. And when you -- are these the type
7 of calculations you do to solve problems in many of
8 the -- much of the work that you do?

9 MR. GORDON: Object to the form of the
10 question.

11 THE WITNESS: Standard, yes, standard.

12 BY MR. ASSAAD:

13 Q. Let me rephrase it. I'm not sure I
14 understand the basis of the objection, but I'll try
15 to rephrase it. When -- when you create boundary
16 conditions in a -- in a model that you're going to
17 solve through CFD, do you go through a mental
18 process to determine the boundary conditions?

19 A. Always.

20 MR. GORDON: Object to the form of the
21 question.

22 MR. ASSAAD: Basis...

23 Oh, you don't have one?

24 MR. GORDON: Are you asking me?

25 MR. ASSAAD: Yeah.

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1 MR. GORDON: It's leading.

2 MR. ASSAAD: Okay.

3 BY MR. ASSAAD:

4 Q. What do you do establish boundaries
5 conditions?

6 A. You look at the physics of the problem,
7 and there are rules for boundary condition: What
8 type... Either they're Dirchilet or Neumann.

9 [Reporter requests clarification.]

10 THE WITNESS: Okay. D -- yeah,
11 D-I-R-C-H-I-L-E-T, Dirchilet, and Neumann,
12 N-E-U-M-A-N-N.

13 BY MR. ASSAAD:

14 Q. Then are these -- did you perform those
15 calculations in your calculations of boundary
16 conditions?

17 A. These are rules you follow for setting up
18 the boundary conditions.

19 Q. Okay. And are those the rules that you
20 follow?

21 A. Yeah, it's --

22 Q. Okay.

23 A. -- a standard thing, yeah.

24 Q. And you followed it in this -- in this
25 analysis?

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1 A. Yes, it's the nature of it. You have to
2 do it by nature, yeah.

3 Q. Okay. Now, you've read Mr. Abraham's
4 report, correct?

5 A. Could you refer it to me. I don't know
6 which one.

7 Q. You've read the report of -- which is
8 marked as Exhibit -- I'm sorry -- Dr. Abraham's
9 report.

10 MS. ANDREWS: Dr. Abraham's...

11 MR. ASSAAD: I apologize.

12 THE WITNESS: Can I see it?

13 MS. ZIMMERMAN: It's not written on it, is
14 it?

15 MR. ASSAAD: It's Exhibit 17, I think;
16 isn't it?

17 MS. ZIMMERMAN: 18.

18 MR. ASSAAD: 18. You have it right there?

19 No.

20 MS. ANDREWS: You do.

21 MS. ZIMMERMAN: Should be the last one,
22 the last one.

23 MS. ANDREWS: Here it is. Sorry. They're
24 out of order.

25 THE WITNESS: I have to read it all? So

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1 you tell me which page.

2 BY MR. ASSAAD:

3 Q. But you definitely recall -- did you read
4 his critique of you?

5 A. Not all of it. Just the seven items.

6 Q. Okay. Before we get to the report, I want
7 to talk about that for a little bit.

8 A. Yes.

9 Q. You have seen his CFD video online on
10 YouTube, correct?

11 A. Correct.

12 Q. And do you know whether or not that was
13 done RANS or LES, the first video?

14 A. In my opinion, it was RANS.

15 Q. Okay. And then it seems like he ran a
16 second model based on his report and he used LES,
17 correct?

18 MR. GORDON: Object to the form of the
19 question. Lack of foundation.

20 THE WITNESS: I think in this report
21 somewhere it says it used to be RANS and later they
22 used LES. I think. I think.

23 BY MR. ASSAAD:

24 Q. Okay.

25 A. I gotta read it carefully, but I think I

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1 remember that.

2 Q. Now -- oh, real quick: Do people in your
3 field, when they have a mesh, inform -- when you
4 solve the problem how many --

5 A. Mesh points.

6 Q. -- how large the mesh is?

7 A. The number of cells.

8 Q. The number of cells, yes.

9 A. It's essential.

10 Q. Why is it essential?

11 A. Because you have to do something called
12 grid independence test. Grid independence means you
13 repeat the same flow computation with successively
14 finer mesh until the results, each to become
15 independent of more refinement. It's called --

16 [Reporter requests clarification.]

17 MR. ASSAAD: More.

18 THE WITNESS: More refinement.

19 BY MR. ASSAAD:

20 Q. And did you do that in this case?

21 A. Yeah, in all -- that's the standard. We
22 teach undergraduate to do that.

23 Q. Okay. Did you see that anywhere in Dr.
24 Abraham's report regarding whether or not he did
25 that or the size of his -- how many cells are in his

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1 mesh?

2 A. Again, I just looked at the pictures. I
3 didn't look -- read what he used.

4 Q. Okay. If you go to page 4 of his
5 report --

6 A. One four? Just four, I see it, yes.

7 Q. If you look under step two, analysis,
8 calculations of cells --

9 A. Yes.

10 Q. -- the second sentence says, "Larger
11 number of grid cells result in a more accurate
12 solution." Do you agree with that?

13 A. Could you tell me where this is.

14 Q. Large...

15 A. Oh, this top here (indicating.)

16 Q. Yeah.

17 A. I read it. That's the first time I read
18 this. "The next step..."

19 Q. You can read it to yourself, though, so
20 it's not --

21 A. "-- is to substitute..."

22 MS. ANDREWS: Read it to yourself.

23 THE WITNESS: Oh, I'm sorry. Okay.

24 The first sentence is correct, it's fine.

25 BY MR. ASSAAD:

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1 Q. Okay.

2 A. So what --

3 Q. The next -- sorry, I'm going to go to the
4 sentence that says, "Large number of grid cells
5 result in more accurate solution." Do you agree
6 with that?

7 A. So in general, larger number of cells in a
8 refinement, refinement, yes, it should produce that.

9 Q. Okay. In the calculations that are
10 presented here, up to 60 million grid cells were
11 employed and high accuracy was obtained. Someone in
12 your field that's writing a report regarding a CFD
13 and describing the mesh, would they give an
14 approximation or would they give an exact number?

15 MR. GORDON: Objection to the form of the
16 question. Also lack of foundation.

17 THE WITNESS: We give exact numbers.

18 BY MR. ASSAAD:

19 Q. Why is that important?

20 A. That's how we trained to do it: To report
21 what you used. It's like an experiment; you report
22 to say what you did.

23 Q. Is the mesh important with respect to
24 the -- to the computer solving the CFD problem?

25 A. Yeah, definitely; it's a known fact.

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1 Q. Okay. Now, were these -- were these --
2 when you put all this stuff in and you had the code,
3 is this done on a regular computer?

4 A. It depends on the mesh. If you -- if you
5 have a small mesh, you can use a set of computer
6 connected in parallel, but if you have a very
7 large -- it depends on the equation you're solving
8 and the mesh -- number of mesh points.

9 Q. Let's talk about the computers that you
10 used. Did you use your personal computer to solve
11 this?

12 A. No, no, no.

13 Q. What computer did you use?

14 A. You use a super computer.

15 Q. And where is a super computer located?

16 A. In different national centers, like
17 Illinois, Texas.

18 Q. Which one did you use?

19 A. I used the one in Texas.

20 Q. Okay. And with respect to your
21 methodology and the super computers, I'd like you to
22 explain how the problem is solved using super
23 computers with the Navier-Stokes equations and
24 relative to the mesh size -- mesh size. Does that
25 make sense or --

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1 A. Well, I give an example, but not
2 everything done this way, but you can divide the
3 number of cells in different processors.

4 Q. Okay.

5 A. So you know, certain zones in the flow
6 are -- sorry, if you have 10,000 processors, you
7 divide this so they can interact with each other.
8 That's how to do that, parallel.

9 Q. And the amount of computer time, is that
10 called CPU time?

11 A. Correct.

12 Q. How much CPU time was used to solve this
13 problem with respect to the Bair Hugger in the
14 operating room?

15 A. Total or per one or --

16 Q. Per run, per scenario. I mean, if it's in
17 report -- I'm not sure if it is or --

18 A. Yeah, I'm just looking, because we make
19 many runs, I cannot recall. Hundred thousand CP
20 hours. Called CP hours.

21 Q. Is that in your report somewhere? If not,
22 it's okay.

23 A. Yeah, that's okay.

24 Q. Can you validate your results with
25 Schlierin testing?

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1 A. No.

2 Q. Are you familiar with Schlierin testing?

3 A. Yes.

4 Q. How are you familiar with Schlierin
5 testing?

6 A. When I was an undergraduate, I used to do
7 experiments using Schlierin testing.

8 Q. And why can't Schlierin validate CFD, in
9 your opinion?

10 A. Schlierin is a visualization technique.
11 It will tell you which part is hot, which part is
12 cold. But it doesn't give you velocity or
13 temperature or anything like that.

14 Q. Okay. And as the -- would you agree with
15 me as the delta temperature -- the delta of the
16 temperature decreases, Schlierin is -- it's more
17 difficult for Schlierin to pick that up?

18 MR. GORDON: Object to the form of the
19 question. Also leading.

20 THE WITNESS: Yeah, if the temperature
21 variation in a given zone is small, then the density
22 gradients will be small and therefore Schlierin will
23 not do.

24 [Reporter requests clarification.]

25 THE WITNESS: Will not do well. I'm sorry

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1 for all this.

2 BY MR. ASSAAD:

3 Q. So you agree with me that what -- would
4 you consider Schlierin a reliable test with respect
5 to air flow?

6 MR. GORDON: Object to the form of the
7 question.

8 THE WITNESS: Schlierin will give you
9 visualization to what's happening in the flow. It's
10 a good visualization technique. It just -- it can
11 put a candle. It can put your hand. You can put
12 hot and cold, and you will see that you can use it
13 for -- yeah, it's a good visualization technique.
14 It will show you what's happening, but cannot tell
15 you how much.

16 BY MR. ASSAAD:

17 Q. Can it show particle movement in a -- in a
18 turbulent flow?

19 A. Okay, Schlierin measures temperature --
20 density gradients.

21 [Reporter requests clarification.]

22 MR. ASSAAD: Gradients.

23 THE WITNESS: Density gradient.

24 So it depends on the -- how hot the
25 particles or how cold. I mean, yeah, it's -- I

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1 have -- I'm not aware; it could have been done. But
2 you need a lot of -- it just measures density
3 gradients created by temperature variation.

4 BY MR. ASSAAD:

5 Q. Let's talk about the 10 micron spheres.

6 A. Okay.

7 Q. Are you saying that a squame is a
8 10-micron sphere?

9 A. I am saying if you put a squame in an air
10 flow, turbulent air flow -- an average squame,
11 because squames vary from different sizes. We took
12 an average -- then a sphere will be following the
13 trajectory of that squame.

14 Q. Okay.

15 A. That's a known thing from 1850.

16 Q. When you say it's known from 1850, what do
17 you mean? Who came up with that --

18 A. Stokes. He derived that.

19 Q. Is that the -- is that the Stokes from
20 Navier-Stokes?

21 A. He -- yes.

22 Q. Okay. And note, the next equations that
23 are -- that -- that --

24 A. He just --

25 Q. -- that are based on CFD, correct?

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1 A. Okay. So if you want to -- if you want to
2 mimic the motion of a small flat object in a
3 turbulent flow and there is no equation in the world
4 for the -- that shows you the development motion of
5 a flat piece of flake, then it is the accurate way
6 to do it: To convert it to a sphere in a way that
7 the sphere and the flake will arrive at the same
8 place at the same time if they are done properly.

9 Q. Okay. So if I understand it correctly, it
10 has -- the 10 microns sphere has the same
11 characteristics as --

12 A. Motion, dynamic characteristic, yes.

13 [Reporter requests clarification.]

14 THE WITNESS: Dynamic characteristic.
15 BY MR. ASSAAD:

16 Q. -- as a squame because that's the only
17 way --

18 A. Yes.

19 Q. -- that science today could calculate the
20 movement --

21 A. Yeah.

22 Q. -- of a particle?

23 A. The simple reason is there is no equation
24 for a flat, small piece in a turbulent flow, none.

25 Q. Okay. And are you familiar with anyone

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1 else that has used a 10-micron squame in an
2 operating room to calculate the particle movement of
3 a squame?

4 A. I think Memarzadek, I saw that, but I
5 don't think -- I don't know where he got it from.
6 He just assumed it.

7 Q. Okay.

8 A. But we computed it.

9 Q. And you computed it in your appendix and
10 put --

11 A. Correct.

12 Q. -- it in your report?

13 A. Correct.

14 Q. And you were criticized by Dr. Abraham
15 over here, sitting here right to my left --

16 A. Okay.

17 Q. -- at this deposition --

18 A. Okay.

19 Q. -- that the squame -- you didn't have the
20 sphere rotating. Do you remember that criticism?

21 A. I do.

22 Q. Okay. What is your response to that
23 criticism?

24 A. Again, I teach fluid dynamics.

25 [Reporter requests clarification.]

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1 THE WITNESS: We teach fluid dynamics,
2 so...

3 BY MR. ASSAAD:

4 Q. Now, remember, I'm not as smart as you, so
5 try to simplify it as much --

6 A. Okay.

7 Q. -- as possible for me.

8 A. Okay. Okay. When you have a sphere
9 rotating, it's subjected to Magnus effect,
10 M-A-G-N-U-S. And that's a German physicist. And it
11 will create a force, normal to the axis of rotation
12 and the direction of the main flow.

13 However, in 1968 Professor Saffman, who
14 was in England and later architect, showed there
15 is -- a sphere moving in a sheer flow is subject to
16 what's called the Saffman lift. There are many
17 books and papers written about it. And it is
18 essential for formation of sand dunes, for example,
19 in the desert because that sand particle has to jump
20 because it has to be lifted by saltation and you
21 need a Saffman lift force to do that. So the
22 Saffman lift force is an essential part of an
23 equation of motion for nonrotating particles.

24 Q. Okay. And you took that into account
25 in --

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1 A. Definitely, because if the squames are on
2 the floor, they have to be lifted some way. You
3 need sheer to lift them.

4 Q. And when you measure particles, particle
5 movement, do you use -- there's something called
6 coupling, correct?

7 A. What do you mean "measure"? I don't --

8 Q. Or when you -- when you track particles or
9 you -- you --

10 A. Yes.

11 Q. -- solve the problem.

12 A. Yes.

13 Q. Is there something called coupling? Like
14 single coupling, double coupling?

15 A. Yes, yes, yes, yes.

16 Q. So what is that?

17 A. So, if you have a turbulent flow and you
18 have a particle in it, if you have very few
19 particles, then they would disburse. Like, if you
20 put some dust, they'll be disburse by turbulent
21 flow. However, if you put tons of them, they will
22 affect the turbulence so it become two-way coupling.
23 And if you put more --

24 [Reporter requests clarification.]

25 MS. ANDREWS: Two-way.

1 THE WITNESS: Two-way.
 2 And if you put much more than that, you
 3 get four-way coupling. And they collide with each
 4 other in addition to the two-way coupling.
 5 BY MR. ASSAAD:
 6 Q. And is understanding the amount of cells
 7 in the coupling very important with respect to a way
 8 you solve particle movements?
 9 A. Correct.
 10 Q. Okay. And did someone -- do you know
 11 anyone that's written a paper with respect to a map?
 12 A. Yeah, it's myself.
 13 Q. Okay. And has it been named a certain
 14 type of map in the community?
 15 A. They refer to it as Elghobashi's mop.
 16 Q. Elghobashi map, okay.
 17 And when did you come up with this map?
 18 A. In 1991.
 19 Q. Okay.
 20 A. 1990.
 21 Q. And how many times has this article been
 22 cited with respect to particle movement in turbulent
 23 flow?
 24 A. I don't recall, but 900 or something like
 25 that.

1 the resolve. We thought, let us see -- put
 2 3 million and see what will happen. We -- any
 3 particle collides with it, we will remove it because
 4 we don't care about it. We want to see if any of
 5 them arrive at that location. Until the very end we
 6 did not know.
 7 Q. Okay.
 8 A. So we neglected nonessential stuff. We
 9 keep only what matters.
 10 Q. Okay. And -- and -- and is it -- there
 11 was some talk about, you know, 3 million being
 12 two percent of the squames. Do you --
 13 A. Right.
 14 Q. -- remember that?
 15 A. Right.
 16 Q. Can the -- the analysis that you did,
 17 could you run it with 50 million squames?
 18 A. Yes.
 19 Q. Okay. How long would it take to do that?
 20 A. It will take more because very -- the --
 21 the particle computation takes more than the fluid
 22 computation.
 23 Q. What percentage does the particle
 24 computation take?
 25 A. Sometimes it takes 70 percent.

1 Q. Do you know whether or not the Elghobashi
 2 map is taught in a -- in classrooms, in fluid
 3 dynamic classrooms?
 4 A. For those people who teach particle in
 5 turbulence, they do it.
 6 Q. Okay. And did you use the Elghobashi map
 7 with respect to --
 8 A. No, because here the 3 million squames are
 9 so tiny, they -- just one-way coupling. It's not
 10 two-way coupling.
 11 Q. That's when -- that's what I'll get to
 12 next.
 13 You're talking about five percent of the
 14 squames hit a solid object?
 15 A. Correct.
 16 Q. Okay. And did you take into account the
 17 elasticity of the squames?
 18 A. No. We -- so we did a solid sphere
 19 hitting a solid. We're just specularly moving,
 20 yeah.
 21 Q. In your -- in your expert opinion, do you
 22 believe that to have a solution, a computation that
 23 leads to solution in this case, they need to
 24 consider elasticity of the squames?
 25 A. The main object of this -- we did not know

1 Q. Okay.
 2 A. Because you track each one each
 3 microsecond everywhere. That takes a long time.
 4 Q. Is the -- is the model that you -- or the
 5 code that you used in this -- in your computational
 6 fluid dynamics, in your opinion, the best code that
 7 could be used in science today?
 8 A. Based on 15 years of validating by 12 or
 9 15 PhD students, I think it's -- it's used now --
 10 DOE supports it. Everybody supports it. It's an
 11 essential thing.
 12 Q. What you say DOE supports it...
 13 A. For jet engines. Fiber content.
 14 Q. So you're telling me the DOE uses the code
 15 that you use for jet engines?
 16 A. No, no, no; they ask us to run it.
 17 Q. Okay. So the DOE asked you to run code
 18 for jet engines on this co -- on this --
 19 A. Right. It's --
 20 Q. -- on this code?
 21 [Reporter requests clarification.]
 22 BY MR. ASSAAD:
 23 Q. So let me rephrase. Let me rephrase the
 24 question.
 25 So the DOE -- people like you consult for

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1 the DOE and use this code to run solutions for jet
2 engines?
3 A. For example; for example, yes.
4 Q. Okay. You also have expertise in DNS,
5 correct?
6 A. Yeah, correct.
7 Q. Okay. And you focus a lot of your
8 research in DNS, correct?
9 A. Correct.
10 Q. And DNS is direct numerical simulation,
11 correct?
12 A. Correct.
13 Q. Could you use DNS on a solution for this
14 operating room?
15 A. No computer in the world today can handle
16 it.
17 Q. And why not?
18 A. Because the Kolmogrov -- okay, the
19 Kolmogrov, K-O-L-M-O-G-R-O-V, Kolmogrov scale is one
20 millimeter in the operating room. And if you divide
21 seven meter, there will be 7,000 millimeter by
22 7,000, by 3,000 for the height, 49 times three, it's
23 about 140 something. Then 10 to the nine.
24 149 billion cells. No computer can do it. Not in
25 the world: China, here, yeah.

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1 A. Okay.
2 Q. His first criticism is: You performed no
3 experiment to validate your model and so your
4 conclusions are unconfirmed and unreliable.
5 A. I disagree.
6 Q. Okay. Why do you disagree?
7 A. Because if you want to do hundred percent
8 validation, you need an experiment using PIV in a
9 room, and nobody published that. So it's a good
10 two -- you need a 2 million dollar to do it.
11 Q. And you mentioned your code has been
12 validated by --
13 A. That's the first step. The second step of
14 the -- in the absence of a PIV experiment in
15 operating room, you go back to all the validation of
16 all the flows that has the same physical ingredient
17 of the operating room, or more.
18 Q. Okay.
19 A. Like, the operating room has no additional
20 physics that is not in the validated thing with
21 experiment in the past.
22 Q. Okay. So -- so if I understand you
23 correctly, you're saying that since the code that
24 you used have done more complex and there's no new
25 physics or new -- new -- I guess no new physics,

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1 Q. Let's go to Dr. Abraham's report.
2 A. This one (indicating).
3 Q. Let's go to his criticisms of you, and
4 then I'm going to end with your criticisms --
5 criticism of his report. We'll go little by little.
6 A. Could you tell me which exactly --
7 Q. Let's go to page 16.
8 A. Okay. Yes. I have what I read in the
9 report, only those. Elghobashi's include -- okay,
10 I -- seven. I looked at the seven. I didn't read
11 the reports.
12 Q. Okay. Well, I'll go to other parts of the
13 report. I just want -- want you --
14 A. Oh, okay.
15 Q. -- to comment on --
16 A. Okay.
17 Q. Because this is our only chance for you
18 to --
19 A. Okay.
20 Q. -- offer any criticisms.
21 A. Okay, okay.
22 Q. And I'm sure after you read his
23 deposition, you might have more criticism of his
24 report, but we don't have his deposition yet. It
25 will be after -- in July.

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1 that, because it's been validated in the past, it's
2 valid now for your solution?
3 A. Correct, it's --
4 Q. What's the Taylor-Green vortex that has
5 been used to validate the LES system that you used,
6 the code that you used?
7 A. Okay. Taylor-Green vortex is a series of
8 counter-rotating vortices that has an analytical
9 solution, so that's -- when you validate codes, like
10 for undergraduate, the first thing you do, you
11 validate with the very few analytical solution
12 from -- Navier-Stokes equation have no analytical
13 solution except for very simple flows, laminar
14 flows. So you tell the student: Go to the
15 analytical solution in a pipe flow and do it and
16 that's fine.
17 On -- Taylor-Green vortices have an
18 analytical solution, which is more complex than a
19 pipe flow, then you do that, so that's --
20 [Reporter requests clarification.]
21 THE WITNESS: Pipe flow, yes. And so on.
22 You go systematically to all the canonical flows:
23 Five channel; turbulent. You do all this, based
24 on -- sometimes you use DNS, which is very accurate
25 for these simple flows, and sometimes you do

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1 experiment. But step by step, you validate for 15
 2 years, and then you know it's good.
 3 BY MR. ASSAAD:
 4 Q. Has DNS ever validated this code that you
 5 used?
 6 A. Yes.
 7 Q. How many times, if you're aware?
 8 A. Channel flow, sheer flow.
 9 [Reporter requests clarification.]
 10 THE WITNESS: Sheer flow. Channel flow.
 11 I have an accent.
 12 Yes. Yeah, so you do that; that's
 13 essential thing. It's mandatory to do that for
 14 everything before you use it.
 15 BY MR. ASSAAD:
 16 Q. Before you use the LES code to --
 17 A. Yeah. You have to test it, uh-huh.
 18 Q. And is validating with DNS a type of
 19 validation accepted among your peers?
 20 A. Yeah, because DNS is more accurate than
 21 experiment.
 22 Q. Okay.
 23 A. Because no human --
 24 Q. So you're -- so you're saying that DNS is
 25 more accurate than an experiment?

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1 A. That's regarding the temperature. But
 2 the -- the -- regarding the mass loads, it's
 3 conserve. Means on a flow -- the air mass flow rate
 4 that leave the blower has to come out along the
 5 drape because the drape covers everything. That's
 6 no assumption.
 7 Q. Okay.
 8 A. The assumption is in the temperature of
 9 the edge of the drape.
 10 Q. Okay. Number three, we've already talked
 11 about the surgical lamp.
 12 A. Because that was a typo.
 13 Q. Okay.
 14 Oh, by the way, what are your assumptions
 15 based upon?
 16 MS. ANDREWS: Do you need this
 17 (indicating)?
 18 MR. ASSAAD: I don't need it.
 19 BY MR. ASSAAD:
 20 Q. What are your assumptions based -- you
 21 just -- I mean, you base your assumptions on
 22 something, correct?
 23 A. About which one? Flow rate or --
 24 Q. About -- about the temperature.
 25 A. The temperature, yeah, I did some estimate

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1 A. For a -- for a small number of flows
 2 because no computer can handle the room, right?
 3 Q. Okay.
 4 A. So the channel, sheer flow, things like
 5 that. So you know the code can handle that.
 6 Q. Okay.
 7 A. This is turbulent flow; it's not laminar.
 8 Q. On number two, Dr. Abraham writes, "The
 9 expert does not clearly define how the Bair Hugger
 10 heated air entered the room. From the incomplete
 11 description given, it appears that he has made a
 12 serious error by allowing the heated air to emerge
 13 along a slot at the edge of the drape. This
 14 assumption is in stark contrast to what happens
 15 during actual use of the Bair Hugger device and
 16 invalidates his analysis."
 17 What is your response of that criticism
 18 by --
 19 A. We discussed this today at length. All
 20 the air flow that leave the Bair Hugger has to leave
 21 the drape somewhere. So we distribute uniformly on
 22 that drape edge.
 23 Q. And is that -- is that the calculations
 24 when you talked about, you thought about it a lot,
 25 that's -- that's the boundary connection?

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1 calculation, yes.
 2 Q. Okay. You did calculations?
 3 A. Not a computer; hand calculations.
 4 Q. And they're mathematical calculations?
 5 A. Correct.
 6 Q. And that -- those calculations were based
 7 on your education, training and experience?
 8 A. Yes.
 9 MR. GORDON: Object to the form of
 10 question.
 11 BY MR. ASSAAD:
 12 Q. And going back to the calculation that you
 13 did, you actually saw a setup that was in Santa
 14 Monica in September which a registered nurse
 15 prepared --
 16 A. Correct.
 17 Q. -- the -- a -- a draping for a patient
 18 that was going to go through knee surgery,
 19 orthopedic knee surgery, correct?
 20 MR. GORDON: Object to the form of the
 21 acquisition.
 22 THE WITNESS: She -- the RN did the setup.
 23 We asked her: "Do the setup as you usually do."
 24 And we waited outside until she did it, and she told
 25 us: "Come in."

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1 BY MR. ASSAAD:

2 Q. Okay. Well, was it -- RN, you mean
3 registered nurse, correct?

4 A. Correct.

5 Q. A registered nurse, okay.

6 A. Yes.

7 Q. Who had experience in setting up --

8 A. She works -- she works in that surgery --
9 that's her job.

10 Q. Okay. And you have no reason to believe
11 that she doesn't know what she was doing when she
12 set up the --

13 A. No.

14 Q. Okay. And that's when you took
15 measurements, correct?

16 A. Correct.

17 Q. And -- and you turned on the Bair Hugger
18 machine?

19 A. Correct.

20 Q. Okay. And you went around the machine and
21 felt where air was coming from?

22 MR. GORDON: Object to the form of the
23 question.

24 THE WITNESS: We asked the patient, the
25 volunteer patient, and she said, "If the air was

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1 coming to my neck, I have contact lenses and it
2 would bother me; I would have told you." She said,
3 "There was no air coming to my face."

4 BY MR. ASSAAD:

5 Q. Okay.

6 A. And we looked everywhere and -- yeah.

7 Q. Number four -- I'm going to skip number
8 three because we already talked about that typo.

9 A. Yes. Num- --

10 Q. Hold on.

11 I'm trying to find out where number four
12 is. My fault. Oh, here we go.

13 Dr. Abraham states, "He claims to present
14 information along two precisely located planes that
15 pass through the roof, but, in fact, his results do
16 not correspond to his purported location." You
17 corrected that today with --

18 A. That's a typo.

19 Q. Okay.

20 A. It was a plus and it says minus or vice
21 versa.

22 Q. And these typos have no effect on your
23 conclusion?

24 A. This is only for typing the report.

25 Q. Okay.

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1 A. Yeah.

2 Q. It has no effect on your calculations
3 or --

4 A. No.

5 Q. -- your conclusions?

6 A. No, no, no, no.

7 Q. Okay. His criticism, number five --

8 A. We discussed.

9 Q. Okay.

10 MS. ANDREWS: 5.1.

11 BY MR. ASSAAD:

12 Q. "His treatment of skin cells as spheres
13 not only has a mathematical error but is based --"
14 [Reporters asks counsel to slow down
15 when reading.]

16 BY MR. ASSAAD:

17 Q. "His treatment of" --

18 MR. ASSAAD: How much time do we have
19 left?

20 THE VIDEOGRAPHER: About six minutes.

21 BY MR. ASSAAD:

22 Q. Okay. "His treatment of skin cells as
23 spheres not only has a mathematical error, but is
24 based upon a faulty premise."

25 A. So I can explain.

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1 So the faulty premise is how to make a
2 flake move like a sphere, and I already answered
3 that. The second one was about the area, if -- if
4 the area is correct because when you have a flat
5 flake, the drag is called viscous drag. You use the
6 same area. If the flake is normal to the floor,
7 it's called form of drag. You use the same area.

8 [Reporter requests clarification.]

9 THE WITNESS: F-O-R-M, form of drag.

10 BY MR. ASSAAD:

11 Q. He writes in red, "The mean that -- this
12 means that the disk is oriented perpendicular to the
13 direction of motion."

14 A. Yes.

15 Q. And then he circled, says, "Flow parallel
16 to circular disk." And he says "Inconsistent
17 assumptions."

18 A. He's wrong.

19 Q. Why is he wrong?

20 A. Because the area is the same. He's
21 just -- I made a -- yeah, I made a sketch. If you
22 have a disk flying parallel to the table, the area
23 used in the surface viscous direct, if the disk
24 become perpendicular to the flow, it's called formal
25 drag. The same area. Just look at undergraduate

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1 book. It's Munson's. It's written somewhere.

2 Q. Okay.

3 A. It's a valid fact. It's not --

4 Q. So it's something you can find in an
5 undergraduate book?

6 A. It is already. I -- I mentioned it.
7 Munson book, on page -- it's in the report. We
8 said -- in the appendix.

9 Q. Okay. Well, we won't have to go to it,
10 but...

11 A. It's a standard undergraduate thing:
12 Viscous drag. Flag. Same area. No change.

13 Q. Okay. Number six is, he states your
14 "treatment of collisions are perfectly elastic."

15 A. I already answered that.

16 Q. Yeah, you already answered that one.

17 A. Okay.

18 Q. Now, number seven is about the inlets.

19 A. Correct.

20 Q. Okay. I think there was some confusion
21 with defense counsel trying to understand what you
22 were saying, so I want to try to clarify it.

23 A. Okay.

24 Q. You're not saying that the vent above the
25 operating room has to be 20 feet high?

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1 A. Never said that.

2 Q. Okay. And I'm going to lead, I'm going to
3 get an objection here, but I'm just going to get if
4 over with, okay.

5 You're saying to simulate the situation
6 where the air is coming out of the grille, that in a
7 mathematical model you have to create that duct?

8 A. It's the most correct way to do it; that
9 anybody else, they don't understand fluid dynamics.

10 Q. Why would it be incorrect to not do it
11 this way?

12 A. Because if you uses ANSYS, apparently the
13 other group used ANSYS, it will tell you what do I
14 do on the inlet? They give you choices.

15 [Reporter requests clarification.]

16 [Indecipherable cross-talk.]

17 THE WITNESS: That's okay. And my throat
18 is getting bad.

19 BY MR. ASSAAD:

20 Q. I'm almost done, so...

21 A. They will give you choices.

22 MS. ZIMMERMAN: We can switch tapes.

23 MS. ANDREWS: Calm down.

24 MS. ZIMMERMAN: We'll take a quick break
25 and let the videographer --

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1 MS. ANDREWS: And you probably need to
2 rest your fingers.

3 Meet me in my office now.

4 THE WITNESS: This concludes DVD No. 3.
5 We're now going off the video record. The time is
6 6:12.

7 (Recess.)

8 THE VIDEOGRAPHER: We are back on the
9 video record. This is DVD No. 4. The time is 6:20.

10 BY MR. ASSAAD:

11 Q. I'd like you to turn to page 27 of --

12 A. Of this --

13 Q. -- of Abraham's report. F -- number -- of
14 Exhibit 18.

15 A. 27.

16 Q. He writes, "Furthermore, his
17 methodology" -- he's talking about you -- "is not
18 accepted by persons in the field of fluid mechanics
19 as they use unvalidated numerical simulation to
20 match real-world results."

21 A. Which?

22 Q. 27 of Abraham's report. Not yours.
23 Abraham.

24 A. I know, but in 27.

25 Q. Page 27.

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1 A. I know, but at which line?

2 Q. Under F8. There's no line numbers.

3 A. Oh, oh, I see.

4 MS. ANDREWS: "As discussed."

5 THE WITNESS: Okay. I see. Let me read
6 it.

7 MS. ANDREWS: Methodology.

8 THE WITNESS: I never read that. Okay.

9 "As discussed in this the section, the
10 plaintiff's expert -- is that me, plaintiff expert?

11 BY MR. ASSAAD:

12 Q. Yeah. It's been a long day.

13 A. -- makes several flawed assumptions and
14 basic errors."

15 I don't know where. I could not -- yeah,
16 I did not do any errors.

17 Okay. "His methodology in --

18 Q. He goes, "Further, his methodology is not
19 accepted by persons in the field of fluid mechanics
20 as they use unvalidated numeric simulation to match
21 real-world results."

22 Do you see that -- do you see where I read
23 that?

24 A. Yeah, I read it.

25 Q. Do you agree with that statement?

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1 A. Of course not. I never read it before.
 2 That's -- that's pretty bad.
 3 Q. Let -- let me ask you, are you a member of
 4 the National Academy of Engineers?
 5 A. Yes.
 6 Q. What is the National Academy of Engineers?
 7 A. National Academy of Engineering is a
 8 independent organization. Has about 2,000 members.
 9 It's the highest level of engineering profession in
 10 the world, I would say. In the world, yes.
 11 Q. Okay. Do you know whether or not
 12 Dr. Abraham's a member of the National Academy of
 13 Engineers?
 14 A. I didn't look.
 15 Q. Okay.
 16 A. I don't look at this.
 17 Q. And who was it founded by?
 18 A. President Abraham Lincoln.
 19 Q. Ex- -- go through the story of how the
 20 National Academy of Engineers was founded.
 21 A. During the World War -- during the Civil
 22 War, in 1865, the president wanted an independent
 23 body of scientists and engineers to explain -- give
 24 him an opinion on difficult issues that they are not
 25 biased and they are not paid by anybody. They --

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1 specific field of particle movement and -- and
 2 turbulent flow?
 3 MR. GORDON: Object to the form of the
 4 question.
 5 THE WITNESS: No.
 6 BY MR. ASSAAD:
 7 Q. Do you know Abraham's, who he studied
 8 under, Ephraim Sparrow?
 9 A. I -- I know about Professor Sparrow. He's
 10 well known.
 11 Q. Okay. What does he focus on? Does he
 12 focus on particle movement in turbulent flow?
 13 A. No, no, no.
 14 MR. GORDON: Object to form of the
 15 question.
 16 THE WITNESS: He is an expert in heat
 17 transfer.
 18 BY MR. ASSAAD:
 19 Q. He's a -- heat transfer?
 20 A. Radiation and heat -- he has a book.
 21 Q. Is heat transfer the same as -- as
 22 particle movement in turbulent flow?
 23 A. No.
 24 Q. Okay.
 25 A. Heat transfer is heat transfer and

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1 they don't have an income from government or
 2 anything.
 3 Q. And how exclusive is the organization?
 4 A. Well, every year, they nominate 1,000.
 5 They select only 50.
 6 Q. 50 out of 1,000?
 7 A. Correct.
 8 Q. Okay. And did you recently win an award
 9 in Italy?
 10 A. I did, yeah.
 11 Q. What was the award for?
 12 A. It's International Conference of
 13 Multiphase Flow. They give it once every three
 14 years to a person who does research in turbulent
 15 flows laden with particles or --
 16 [Reporter requests clarification.]
 17 THE WITNESS: Turbulent -- the same word.
 18 Laden, L-A-D-E-N, with particles or droplets or
 19 bubbles.
 20 BY MR. ASSAAD:
 21 Q. Okay. Are you aware of -- have you read
 22 any articles by Dr. Abraham dealing with particle
 23 movement in turbulent flow?
 24 A. No, no, I have not.
 25 Q. Have you come across Dr. Abraham in that

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1 particle --
 2 Q. Okay.
 3 A. Yeah.
 4 Q. Now, Professor Apte in Stanford --
 5 A. Yes.
 6 Q. -- he was aware of your methodology and
 7 the results, correct?
 8 A. Yes.
 9 Q. At any time did he disagree with your
 10 methodology or results in this case?
 11 MR. GORDON: Object to the form of the
 12 question.
 13 MR. ASSAAD: Basis?
 14 THE WITNESS: No.
 15 MR. GORDON: You're calling for a -- an
 16 outside opinion of -- A, it's leading, but you're
 17 calling -- you're -- you're -- it's a foundation
 18 objection as well.
 19 MR. ASSAAD: Well -- well, your expert
 20 said that his methodology is not accepted by persons
 21 in the field of fluid of mechanics. I mean, you
 22 guys set this up.
 23 BY MR. ASSAAD:
 24 Q. So is -- is Dr. Apte an expert in fluid
 25 meta- -- mechanics?

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1 A. Yes.
 2 Q. Okay.
 3 A. He's at Stanford, yeah.
 4 Q. And you had -- you met with him, correct?
 5 A. We always meet, yeah.
 6 Q. Okay. And if he had a problem with your
 7 methodology, he would tell you, correct?
 8 MR. GORDON: Object to the form of the
 9 question.
 10 BY MR. ASSAAD:
 11 Q. Well, did he ever tell you he had a
 12 problem with your methodology?
 13 A. What?
 14 Q. Did he ever say to you in your meetings
 15 when you -- when you -- when you hired his grad
 16 students --
 17 A. Right.
 18 Q. -- that your methodology is not accepted
 19 among -- among the -- the fluid mechanics experts?
 20 A. No. No.
 21 Q. Okay. And you've worked together before
 22 with Dr. Apte?
 23 A. Not really. I met him many times in
 24 conferences and presentations, but I have not worked
 25 with him personally.

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1 report, do you know whether or not Dr. Abraham
 2 used -- or -- or solved for the particle movement
 3 through the operating room environment, or did he do
 4 something else?
 5 MR. GORDON: Object to the form of the
 6 question.
 7 THE WITNESS: I -- all I see in the report
 8 of Dr. Abraham is the fluid particle -- fluid
 9 particle -- like motion or, like, tracing of fluid
 10 points.
 11 BY MR. ASSAAD:
 12 Q. Okay. What's the difference between
 13 tracing of fluid points that Dr. Abraham did and
 14 what you did?
 15 A. Okay. If you sprinkle some power in a
 16 turbulent flow, these particles do not follow the
 17 flow.
 18 Q. Wait. Let -- let me understand. Are you
 19 saying particles don't follow air flow?
 20 A. Do not follow the local air flow.
 21 Q. Okay. What do you mean by that?
 22 A. Because particles -- particle motion is
 23 controlled by drag, lift, added mass, many other
 24 terms, plus buoyant -- plus gravity term. If you
 25 neglect all these terms, you would be assuming that

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1 Q. And what conferences would you -- were you
 2 referring to?
 3 A. American Physical Society of Fluid
 4 Dynamics.
 5 Q. Okay. Have you ever seen Dr. Abraham at
 6 any of these societies?
 7 A. No, but the -- the conference is quite
 8 big. I do not know what -- yeah.
 9 Q. All right. Do you keep up to date with
 10 all the -- the journals and articles dealing with
 11 particle flow in turbulent environments?
 12 MR. GORDON: Object to the form of the
 13 question.
 14 THE WITNESS: Well, I review many of them,
 15 so I -- I read -- I review for the leading journals.
 16 BY MR. ASSAAD:
 17 Q. Okay. Have you ever come across an
 18 article on -- on particle movement ever written by
 19 Dr. Abraham in turbulent flow?
 20 A. No.
 21 Q. Okay. Before today, before this case,
 22 have you ever heard of Dr. Abraham?
 23 A. No.
 24 Q. Okay. Based on your review of the 3M
 25 videos and a little bit of the pictures in this

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1 the particle follow the fluid. They don't.
 2 Q. Okay. In real life scenarios on stuff
 3 that you've worked on in the past --
 4 A. Yes.
 5 Q. -- does particle follow air flow?
 6 A. Only if the particle is 1 micron.
 7 Q. Okay.
 8 A. Not 25 or not 20 or 10.
 9 Q. Okay.
 10 A. For that density.
 11 Q. Okay. Go ahead.
 12 A. The density of the squames is like water.
 13 Q. Okay. Are you familiar with the
 14 Boussinesq approach that was used by Dr. Abraham?
 15 A. Yes.
 16 Q. Okay. Is -- as a -- as a person who's an
 17 expert in the field of -- of particle movement in
 18 turbulent flow -- let's back up further one second.
 19 Okay.
 20 Does a laminar diffuser -- is the flow in
 21 an operating room laminar or turbulent?
 22 A. Turbulent.
 23 Q. Why is it turbulence?
 24 A. Reynolds' number is about 10,000.
 25 [Reporter requests clarification.]

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1 THE WITNESS: Reynolds. Yes.
 2 BY MR. ASSAAD:
 3 Q. So as a expert in fluid flow, would you
 4 consider any operating room have true laminar flow?
 5 A. Never.
 6 Q. Okay. You have done -- in your CFD
 7 analysis, does the -- when the Bair Hugger's turned
 8 on, does it increase the intensity of the turbulence
 9 around the operating room table?
 10 A. Correct. The intensity increases because
 11 the rising plume interacts with the ambient air,
 12 creates a sheer layer, and therefore, the intensity
 13 turbokinetic energy increases.
 14 Q. Okay. This -- the calculation that you've
 15 done is -- is basically -- turbulence is very
 16 important to the -- to the -- solving this problem?
 17 A. Definitely.
 18 Q. Why is turbulence important?
 19 A. Because turbulence increases dispersion of
 20 particles and dis- -- and diffusion of any scaler,
 21 like heat or any species. Turbulent is a good
 22 mixer.
 23 Q. So turbulent means mixing?
 24 A. Absolutely.
 25 Q. Okay. Now, Dr. Abraham used something

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1 variation --
 2 [Reporter requests clarification.]
 3 THE WITNESS: Temperature variation, the
 4 temperature everywhere is not uniform. It varies in
 5 time and space. And, therefore, we have to account
 6 for the local variation of density in order to have
 7 a correct solution -- or reliable solution.
 8 BY MS. ANDREWS:
 9 Q. Because the partic- -- the density of the
 10 air will have an effect on the particle?
 11 A. Definitely. Dispersion.
 12 Q. And by using the Boussinesq approach,
 13 you -- you take away that force on the particle by
 14 removing density?
 15 MR. GORDON: Object to the form of the
 16 question.
 17 THE WITNESS: Well, you change -- you are
 18 not solving the correct equation. That's what it
 19 is.
 20 BY MR. ASSAAD:
 21 Q. Okay. How does using the Boussinesq
 22 approach, how would that affect the calculations
 23 that -- that are needed to calculate the particle
 24 movements in an operating room?
 25 A. It's a -- a general question, and I -- I

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1 called the Boussinesq approach.
 2 A. Yes.
 3 Q. Are you familiar with the Boussinesq
 4 approach?
 5 A. Yes.
 6 Q. Okay. How does the Boussinesq -- does the
 7 Bouss- -- would a -- the Boussinesq approach be the
 8 correct approach in a problem such as this?
 9 A. No.
 10 Q. Why not?
 11 A. Boussinesq approach considered the density
 12 of the air or the fluid to be uniform, constant
 13 everywhere except for the buoyancy term, which
 14 appears in the Navier-Stokes equation. And,
 15 therefore, the nonlinear terms in Navier-Stokes
 16 equation will not have the influence of density
 17 variation.
 18 [Reporter requests clarification.]
 19 THE WITNESS: Density variation.
 20 BY MR. ASSAAD:
 21 Q. In -- in a situation like this, how
 22 important is density variation?
 23 A. It's crucial, because you have a heating
 24 source, whether it's a lamp or the air -- Bair
 25 Hugger, or the heads of people, any temperature

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1 just say, basically, you must use correct equations
 2 for a given flow, and Boussinesq is not the right
 3 one for this flow.
 4 Q. What would Boussinesq be the appropriate
 5 flow equation for?
 6 A. For -- if you have a -- a room like this
 7 with no air conditioning and you have a heat source
 8 like a lamp or a candle, that would be a good --
 9 it's a --
 10 [Reporter requests clarification.]
 11 THE WITNESS: Good approximation.
 12 Basically, Boussinesq approximation is
 13 correct for natural convection. Natural convection
 14 means no electric motor, blower or anything.
 15 BY MR. ASSAAD:
 16 Q. So with an operating room that has a lot
 17 of flow coming in from the ceiling --
 18 A. Right, right.
 19 Q. -- the -- the Boussinesq approach would
 20 not be an accurate --
 21 A. Be- -- not because of the air coming from
 22 the ceiling. Because there are temperature
 23 variation in the room for --
 24 [Reporter requests clarification.]
 25 MR. ASSAAD: Temperature variations.

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1 THE WITNESS: Variation in the room at
2 different locations because people, lamps, blower,
3 these are sources distributed. It is not a quiet
4 and ambient surroundings.

5 BY MR. ASSAAD:

6 Q. Okay.

7 THE REPORTER: Counsel...

8 MS. ANDREWS: Yes?

9 THE REPORTER: Here.

10 MS. ANDREWS: Thanks. I'm out of gas.
11 Thank you.

12 BY MR. ASSAAD:

13 Q. You've never been an expert witness before
14 on the litigation, have you?

15 A. Thank God.

16 Q. Is there a reason why you got involved in
17 this case?

18 A. I think they told me in the first week or
19 so that this involves patients who are suffering or
20 something like that. I don't know the details.

21 Q. Uh-huh.

22 A. So just trying to help; that's all.

23 Q. Okay. And there -- there were -- there
24 were questions raised out to you about whether or
25 not you reached out to the FDA or the CDC or

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1 anywhere else. Do you remember those questions?

2 A. I do.

3 Q. You -- you've signed a protective order in
4 this case, correct?

5 A. Correct.

6 Q. Okay. So a lot of the information that
7 you have you can't share with -- with the public,
8 correct?

9 A. Correct.

10 Q. Okay. And you agree that patients' lives
11 matter?

12 A. Definitely.

13 Q. And the safety of patients matter,
14 correct?

15 A. Yes.

16 Q. Okay. In effect, you've worked with, I
17 think, the NIH to do research on sleep apnea,
18 correct?

19 A. Correct.

20 Q. Let -- let -- and that used DNS, correct?

21 A. Yes.

22 Q. Okay. And that's when you would -- you
23 would send a camera down the -- the tracheal tube?

24 A. Yes.

25 Q. And -- and create a image of -- of the --

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1 of the trach and -- and the -- and the --

2 A. The whole -- the 3D geometry of the
3 airway.

4 Q. And you'd use the CFD to how -- how to fix
5 the sleep apnea, correct?

6 A. Correct.

7 Q. And what was the -- what was the success
8 rate on the work that you did on the patients that
9 they did?

10 [Reporter requests clarification.]

11 BY MR. ASSAAD:

12 Q. The success rate on the patients that
13 you -- that you did the CFD for and the resolution
14 of sleep apnea?

15 A. Okay. The -- I don't know many patients
16 does this, but in critical operations, they would
17 need something like this because the surgeon doesn't
18 know where the blockage is. So you have to be --
19 you have to be very accurate in direct simulations
20 to get the right blockage before the operation.

21 Q. And you would show them where the blockage
22 was with the CFD, correct?

23 A. Correct, correct, correct.

24 Q. And they would go operate on -- on the
25 patient, correct?

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1 A. Right, but not many. Just very critical
2 cases.

3 Q. And out of those critical cases, was --
4 what was the success rate to -- to resolve the sleep
5 apnea?

6 A. Well, it just -- as -- as we predicted,
7 yes.

8 Q. Well, was it 100 percent success?

9 A. Right, but I don't know how many. I mean,
10 yeah.

11 Q. Okay. You've offered many opinions in
12 this case in your report, correct?

13 A. Correct.

14 Q. And you stand by your report?

15 A. Definitely.

16 Q. And -- and your -- your opinions are held
17 to a reasonable degree of engineering certainty,
18 correct?

19 A. What I did is -- as far as I know, is very
20 accurate.

21 Q. Okay. And you stand by your opinions?

22 A. Yes.

23 Q. And, in fact, you've actually submitted
24 your report for publication, correct?

25 A. I did.

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1 Q. Okay. To a peer-reviewed journal,
2 correct?
3 A. Yes.
4 Q. Okay. And by the way, you've just
5 received in the past couple weeks the reports of
6 Abraham -- Dr. Abraham, Dr. Kuehn and Gary Settles,
7 correct?
8 A. But I -- I did not read all of them.
9 Q. Okay.
10 A. I just read parts of Dr. Abraham.
11 Q. You received it about two weeks ago,
12 correct?
13 A. Right, but I -- I was --
14 Q. Okay.
15 A. -- busy, so...
16 Q. Right. Give me a minute.
17 This is more of a legal term. We use a
18 term reasonable degree of engineering certainty.
19 A. Okay.
20 Q. Okay. Do you understand what that means?
21 A. I think I was told it's 99 percent or
22 something like that.
23 Q. It's over 50 percent.
24 A. Okay.
25 Q. When I say do you stand by your opinions,

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1 A. Okay.
2 Q. Not because it's just late, but I just
3 love talking to you about engineering stuff --
4 A. Okay.
5 Q. -- and it's very interesting.
6 A. Okay.
7 Q. The -- the Boussinesq model, what -- you
8 say that's the incorrect approach, correct?
9 A. For this flow.
10 Q. Okay. What is the correct approach?
11 A. To solve the complete Navier-Stokes
12 equation, which we did.
13 Q. And that's using Legrange?
14 A. Well, Legrange is only for the particles.
15 Q. Okay.
16 A. So you have to follow the particle
17 trajectories.
18 Q. Oh, so is the Boussinesq doesn't deal with
19 the particles; it just deals with --
20 A. Yeah, but fluid only.
21 Q. Only fluid, okay.
22 A. Correct, correct, correct.
23 Q. All right.
24 Okay. Do -- do you see anywhere in page 5
25 of Abraham's report --

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1 do you believe -- or do you have -- strike that.
2 You believe your opinions are accurate,
3 correct?
4 A. Based on the results, yes.
5 Q. And based your education, training and
6 experience and the -- the code they use, correct?
7 A. Yes.
8 Q. Do you stand by your results and do you
9 believe that when we use the term of reasonable
10 degree of prob- -- of engineering certainty, we --
11 it is a -- let me back up. Okay.
12 What level of certainty do you believe
13 that your results and opinions are on a scale from 1
14 to 100?
15 A. 99 -- I mean, yes, that's good.
16 MS. ANDREWS: Let me just ask for a
17 record, clarification, she wrote 90, dash,
18 99 percent.
19 THE WITNESS: 99 percent.
20 BY MR. ASSAAD:
21 Q. 99 percent, okay.
22 MS. ANDREWS: You said 99 percent?
23 THE WITNESS: Yes, right.
24 BY MR. ASSAAD:
25 Q. A couple more questions.

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1 A. Yes... Which --
2 Q. Do you see anywhere in his report that
3 indicates what type of model or calculations he did
4 to calculate particle -- the particle movement?
5 A. I didn't read this, but I can see.
6 Usually it will show an equation for particles and
7 how many particles and I don't see it.
8 Q. Do you see any equations in his report?
9 A. I didn't read, but I can look.
10 Q. So for all we know, he might not even have
11 used the Navier-Stokes equations, correct?
12 MR. GORDON: Object to the form of the
13 question.
14 THE WITNESS: I -- I -- any CFD will have
15 to use --
16 [Reporter requests clarification.]
17 THE WITNESS: Any CFD -- Charlie, Frank,
18 David -- will use Navier-Stokes, yeah.
19 BY MR. ASSAAD:
20 Q. Does it mention here what -- what code he
21 used? Do you see that anywhere?
22 A. Somewhere I -- I see ANSYS, but I -- I
23 cannot locate it. I haven't read --
24 Q. I don't think it's here. I think we just
25 assumed it based on the picture.

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1 A. Maybe.
 2 MR. GORDON: If that was a question, then
 3 I object to it.
 4 MR. ASSAAD: Excuse me?
 5 MR. GORDON: If that was a question --
 6 MS. ANDREWS: Ask a new question.
 7 MR. GORDON: -- I don't know --
 8 BY MR. ASSAAD:
 9 Q. So you would agree with me that, sitting
 10 here today, looking at Dr. Abraham's report, someone
 11 such as yourself, who is -- in a fluid -- a fluid
 12 dynamics expert, could not decipher the
 13 methodology --
 14 A. Correct.
 15 Q. -- that Dr. Abraham used?
 16 A. Correct.
 17 MR. GORDON: Object to the form of the
 18 question.
 19 BY MR. ASSAAD:
 20 Q. Okay. Do you know what methodology
 21 Dr. Abraham used, looking at his report?
 22 A. No.
 23 Q. Okay. Do you know whether or not he used
 24 squames or cell -- or spheres?
 25 A. No.

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1 Q. Do you see any type of turbulent flow
 2 shown in any of these pictures that you've seen?
 3 A. It could be -- these color pictures could
 4 be anything.
 5 Q. Okay.
 6 A. I'm just assuming these are trajectories
 7 of points or something.
 8 Q. Okay.
 9 MR. ASSAAD: I have no further questions,
 10 but Dr. Elghobashi reserves the right to -- first,
 11 he'll read and sign and have an opportunity to read
 12 Dr. Abraham's deposition and the right to rebut down
 13 the road at trial or Daubert.
 14 [Reporter requests clarification.]
 15 MR. ASSAAD: Daubert motions.
 16 MR. THORNTON: Just put his hourly rate on
 17 the record.
 18 MR. ASSAAD: Huh?
 19 MR. THORNTON: His hourly rate for
 20 deposition.
 21 MR. ASSAAD: Oh, you want that on the
 22 record?
 23 MS. ZIMMERMAN: Yeah. I don't think we
 24 said the --
 25 MR. ASSAAD: I don't --

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1 Q. Okay. Do you know whether or not he used
 2 Lagrange principles or Euler principles?
 3 A. No, because that would involve particle --
 4 [Reporter requests clarification.]
 5 THE WITNESS: That would involve
 6 particles.
 7 BY MR. ASSAAD:
 8 Q. Okay. So it looks like these dotted lines
 9 are just air streams, correct?
 10 A. I think --
 11 MR. GORDON: Object to the form of the
 12 question.
 13 MS. ANDREWS: Page...
 14 MR. ASSAAD: Page 7 and 6.
 15 THE WITNESS: Right. These look like
 16 some -- it's trajectories of something, but it's
 17 not -- it's probably points from ANSYS or Fluent.
 18 BY MR. ASSAAD:
 19 Q. Okay.
 20 A. I'm not sure.
 21 Q. Do you know whether or not, based on the
 22 report, that Dr. Abraham calculated the turbulent --
 23 turbulent intensity anywhere in the operating room?
 24 A. I cannot say because there are no
 25 equations written.

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1 BY MR. ASSAAD:
 2 Q. Dr. Elghobashi, your hourly rate is \$800
 3 an hour?
 4 A. Only for consulting. Not for deposition.
 5 Q. Okay. What's it for -- what is it for
 6 deposition?
 7 A. 1500 an hour or 10,000 a day.
 8 Q. Okay.
 9 MR. ASSAAD: That's all I have.
 10 MR. GORDON: I just have a couple in the
 11 interest of time. No, no, no. Just keep that. I
 12 don't want to use that mic.
 13 FURTHER EXAMINATION
 14 BY MR. GORDON:
 15 Q. In your -- in your expert report, Doctor,
 16 do you say anywhere that your deposition rate was
 17 what you just said?
 18 A. Nobody asked me before. Nobody. I
 19 just -- they asked me what is your consulting rate
 20 for this group here, and I did 800, yes.
 21 Q. Okay. And this is your first deposition
 22 ever, right?
 23 A. Ever.
 24 Q. So how did you come up with a rate of
 25 \$1500 an hour or \$10,000 a day?

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1 A. I asked people who did depositions and,
 2 yeah -- I -- before.
 3 Q. When?
 4 A. A few weeks ago.
 5 Q. Okay. Mr. Assaad asked you a few minutes
 6 ago about you having signed a confidentiality order.
 7 Do you remember that?
 8 A. I did.
 9 Q. And that was -- he asked you that in the
 10 context of questions about saying something or
 11 sharing anything with the FDA.
 12 A. Correct.
 13 Q. Do you remember?
 14 A. Yeah.
 15 Q. Did -- did you think that the
 16 confidentiality order prohibited you from sharing
 17 anything with the FDA?
 18 A. No. We --
 19 MS. ANDREWS: Objection. Calls for
 20 speculation.
 21 THE WITNESS: We have --
 22 MR. GORDON: Wait, wait. How many lawyers
 23 are -- are handling this case now?
 24 MS. ANDREWS: That's a good question. How
 25 many experts?

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1 handling the --
 2 MS. ANDREWS: I presented him with this.
 3 MR. ASSAAD: -- science part.
 4 THE REPORTER: One at a time, please.
 5 THE WITNESS: Yeah, she cannot do it.
 6 MR. ASSAAD: I can handle it. I don't
 7 think it's a big deal to -- to let her present it.
 8 MS. ANDREWS: It's a big deal to him.
 9 MR. ASSAAD: Yeah.
 10 MS. ANDREWS: So I stand on the fact that
 11 one lawyer in a multidistrict litigation within a
 12 protocol that is not clearly described in the order
 13 by this court may defend only one objection at a
 14 time. One counsel at a time. I'm one person. I
 15 made one objection. There were not numerous
 16 objections.
 17 If you'd like to ask another question,
 18 we're happy to have the witness answer it.
 19 Go ahead.
 20 MR. GORDON: Okay. Could you read the
 21 question back, please.
 22 (Record read as follows:
 23 "Q. Did you think that the
 24 confidentiality order prohibited you
 25 from sharing anything with the FDA?")

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1 MR. GORDON: No, no.
 2 MR. ASSAAD: I'll handle it.
 3 MR. GORDON: Mr. Assaad handled the -- the
 4 examination.
 5 MS. ANDREWS: I don't think --
 6 MR. GORDON: You don't --
 7 MS. ANDREWS: I don't think any --
 8 MR. GORDON: You don't now get to --
 9 MS. ANDREWS: I don't think --
 10 MR. GORDON: -- now jump in and --
 11 MS. ANDREWS: -- that you have the rules
 12 correct, but if Mr. Assaad would like to make
 13 objections --
 14 MR. GORDON: Really? So if we send three
 15 or four lawyers.
 16 MS. ANDREWS: If you prefer him...
 17 THE REPORTER: Please, one at a time.
 18 It's way too late for this.
 19 MR. ASSAAD: It is. I'll han- -- just...
 20 MR. GORDON: I just want to know: Are
 21 plaintiffs taking the position now that if we send
 22 more than one lawyer to a deposition, both will --
 23 two or more lawyers get to --
 24 MS. ANDREWS: Counsel.
 25 MR. ASSAAD: She's presenting and I -- I'm

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1 MS. ANDREWS: Objection. Form.
 2 THE WITNESS: I -- I never spoke to
 3 anybody outside this group about this project. When
 4 I asked people about the rate --
 5 MS. ANDREWS: That's -- you've answered
 6 the question, Doctor.
 7 THE WITNESS: Oh, sure, okay.
 8 BY MR. GORDON:
 9 Q. But you said you submitted this to a -- a
 10 journal for publication?
 11 A. Right.
 12 Q. That's outside of this litigation, right?
 13 MS. ANDREWS: Objection. Form.
 14 You can answer.
 15 THE WITNESS: We submitted for
 16 publications, but it's all now confidential between
 17 the editor and the reviewers.
 18 BY MR. GORDON:
 19 Q. Who's we who submitted it for publication?
 20 A. I did.
 21 Q. Anybody else besides yourself?
 22 A. The Dr. Apte.
 23 Q. Okay. What journal did you submit it to?
 24 MS. ANDREWS: Objection.
 25 THE WITNESS: I cannot do that. It's

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1 confidential.

2 BY MR. GORDON:

3 Q. Confidential under what?

4 MS. ANDREWS: Counsel, the rules of
5 submitting treatises for publication are well-known
6 in the academic community. I can certainly let you
7 know that he cannot talk about a pending
8 publication. Ask any of your experts, which we will
9 not ask them about. It has not been published. It
10 is now going through the peer review process, which
11 is sacred --

12 [Reporter requests clarification.]

13 MS. ANDREWS: It is going through the peer
14 review process --

15 THE WITNESS: Peer review.

16 MS. ANDREWS: -- which is sacred, and will
17 not be the subject of questioning today and he will
18 not be allowed to discuss it, so said -- so says the
19 witness to us and to everyone in this case.

20 MR. GORDON: Okay. This is a federal
21 court proceeding. We are entitled to his testimony
22 under oath, unless you are objecting on a basis of a
23 recognized legal privilege. I'm not aware of an
24 attorney-client privilege, a peace-priest-penitent
25 privilege, or anything else that would apply to

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1 submission to a journal. Maybe you're aware of some
2 case law that says submission to a journal confers a
3 privilege such that it precludes testimony, but I
4 want to make it very clear that we are going to ask
5 the Court to order Dr. Elghobashi to answer the
6 question, what journal did he submit this to, and
7 the follow-up questions to that would be when and
8 what communication he's had on that.

9 If you're saying that you're not -- you're
10 instructing him not to answer on whatever basis it
11 is you -- you are doing so, that's -- that's your
12 prerogative and we'll take it up with the Court.

13 MS. ANDREWS: Counsel, I'm invoking, on
14 behalf of Dr. Elghobashi, and the peer-reviewed --
15 academic peer-reviewed literature in the academic
16 community, a document that's been upheld in Federal
17 Court known as the Ingelfinger rule. It's
18 well-known. He cannot talk about it. We are not
19 allowed to ask about it. And the journals
20 themselves may not discuss it. Any peer-reviewed
21 literature process is private and it is not the
22 province of this man's academic work and intrusion
23 into his work at this point.

24 If you need to pursue a court order, I
25 would meet and confer with you about it as long as

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1 we can maintain the confidentiality, but we're
2 refusing to answer the question today.

3 MR. GORDON: Well, you -- you recognize
4 that there is a protective order in this case and if
5 he were to testify about this journal, you could
6 designate that testimony confidential under the
7 protective order.

8 You're aware of that, aren't you, Counsel?

9 MS. ANDREWS: It doesn't have anything to
10 do with this litigation. It is outside of it. It
11 is an academic process that has a completely
12 different set of rules that have been repeatedly
13 upheld by the courts, and we are going to observe
14 that today. If we want to meet and confer about it
15 and get further -- have further discussion, but not
16 today.

17 MR. GORDON: Okay.

18 BY MR. GORDON:

19 Q. When did you submit your publication or
20 submit your expert report for publication?

21 A. Probably four weeks ago.

22 Q. Okay. Were you encouraged to do so by
23 plaintiff's counsel?

24 A. Never, never.

25 Q. Did you even advise them that you were

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1 going do that?

2 MR. ASSAAD: Objection. Sorry.
3 Communication.

4 MS. ANDREWS: You can answer.

5 THE WITNESS: I asked them whether it's
6 okay. I made it only -- not for myself. I made it
7 for the students who did the work. I don't need
8 that paper. I did it only for the poor students who
9 worked for four or five months. That is the only
10 reason. It's not to tell people about it or --

11 MS. ANDREWS: I think you've answered the
12 question, Doctor.

13 THE WITNESS: Yeah, yeah. Okay.

14 BY MR. GORDON:

15 Q. Earlier you said that the -- that the CFD
16 model that you use is validated every year?

17 A. Correct.

18 Q. Why? It's already been validated, right?

19 A. No. Each year you have different physics.
20 Like in first, will be isothermal flow. Next year,
21 you add particle. Next year, you add vaporation.
22 Next year, you add chemical reaction. Each step, as
23 I said earlier many times, it has to be validated.
24 You mentioned airplane, when you change something.
25 That's the same thing. Every time you put new

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1 physics, you have to validate it again. So now it's
2 a validate for so many pieces of the puzzle.

3 Q. I'm -- what do you mean by new physics of
4 an airplane?

5 A. Okay. You were sitting here and you said
6 if you have an airplane flying and then you make a
7 change, you have to do something to the -- to the
8 education of the pilots or something. You said that
9 here today. When I said it's like a plane, I
10 mentioned a plane has been tested for four years,
11 then they allow passengers to use. And you said --

12 [Reporter requests clarification.]

13 THE WITNESS: Then you can allow
14 passengers to use it. And you said but if a plane
15 has been flying and then you make a modification,
16 you have to test it. I don't remember what you
17 said, but it should be in the record here. So I'm
18 saying now the code has been running for isothermal
19 flows, you test it. Another student comes, you do
20 it for particles; you test it again because you have
21 new physics.

22 So the jet engine test has all the physics
23 he can think of, compressible, particles,
24 vaporization, heat transfer --

25 [Reporter requests clarification.]

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1 video -- this concludes the videotaped deposition.
2 We're now going off the video record. The time is
3 6:57.

4 (Whereupon, the deposition adjourned at 6:57 p.m.)

5 -oOo-

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1 THE WITNESS: -- chemical reaction, and
2 unsteady and swirl -- unsteady and swirl. There are
3 no more complications than this.

4 BY MR. GORDON:

5 Q. And did you say the Pratt & Whitney used
6 this CFD model --

7 A. Correct.

8 Q. -- to design --

9 A. Correct.

10 Q. -- let me finish -- design jet engines?

11 A. Yes.

12 Q. Okay. But they still measure velocity and
13 temperature, right?

14 A. Yes. You always measure for airplane.
15 You measure parts, but they use it to get to the
16 99 percent. Yes.

17 MR. GORDON: Nothing further.

18 MS. ANDREWS: Do you guys have a
19 stipulation or are you --

20 MR. ASSAAD: Thank you.

21 MS. ANDREWS: Do you have a stipulation?

22 MR. ASSAAD: No.

23 MS. ANDREWS: No? No stipulation. Okay.

24 MR. ASSAAD: Okay.

25 THE VIDEOGRAPHER: This concludes the

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1 I, Witness _____, do hereby declare under
2 penalty of perjury that I have read the foregoing
3 transcript; that I have made any corrections as
4 appear noted, in ink, initialed by me, or attached
5 hereto; that my testimony as contained herein, as
6 corrected, is true and correct.

7 Executed this _____ day of

8 _____, 20____, at

9 _____,
10 (City) (State)

11 _____
12 Witness

13 Volume

1 STATE OF CALIFORNIA)
 2) ss.
 3 COUNTY OF LOS ANGELES)

4 I, Elizabeth Borrelli, Certified Shorthand
 5 Reporter, Certificate No. 7844, for the State of
 6 California, hereby certify:

7 I am the deposition officer that
 8 stenographically recorded the testimony in the
 9 foregoing deposition;

10 Prior to being examined the deponent was
 11 first duly sworn by me;

12 The foregoing transcript is a true record
 13 of the testimony given;

14 Before completion of the deposition,
 15 review of the transcript [] was [X] was not
 16 requested. If requested, any changes made by the
 17 deponent (and provided to the reporter) during the
 18 period allowed are appended hereto.

19 Dated: 6-20-2017

20
 21
 22
 23
 24
 25
 ELIZABETH BORRELLI, CSR 7844

1 NAME OF CASE: In Re: Bair Hugger Forced Air Warming
 2 Products Liability Litigation
 3 DATE OF DEPOSITION: Thursday, June 15, 2017
 4 NAME OF WITNESS: Said Elghobashi

5 Reason Codes:

- 6 1. To clarify the record.
- 7 2. To conform to the facts.
- 8 3. To correct transcription errors.

9 Page ____ Line ____ Reason ____

10 From ____ to ____

11 Page ____ Line ____ Reason ____

12 From ____ to ____

13 Page ____ Line ____ Reason ____

14 From ____ to ____

15 Page ____ Line ____ Reason ____

16 From ____ to ____

17 Page ____ Line ____ Reason ____

18 From ____ to ____

19 Page ____ Line ____ Reason ____

20 From ____ to ____

21 Page ____ Line ____ Reason ____

22 From ____ to ____

23

24

25

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